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Contents.

Congress at Birmingham—

CONFERENCE I.—Representatives of Sanitary Authorities.

"Open-air Schools," by J. R. Kaye, M.B., D.P.H. 265

"The Qualifications and Training of a Health Visitor," by Prof. H. R. Kenwood, C.M.G., M.B., D.P.H. 267

T. Eustace Hill, O.B.E., M.A., M.B. 269

"Health Visiting and School Attendance," by Joseph Cates, M.D., D.P.H. ... 271

"Pollution of Streams by Waste from Cheese and Milk Factories," by Arthur F. Somerville, J.P. 274

CONFERENCE II.—Medical Officers of Health.

Address by John Robertson, C.M.G., O.B.E., M.D. 276

"After Care of Patients Suffering from Consumption," by H. Gordon Smith, M.A., M.B., D.P.H. 280

"Domestic Animals as a Factor in the Spread of Infection," by William G. Savage, B.Sc., M.D. 285

"The Incidence of Fatal Rheumatic Heart Disease in Bristol, 1876-1913," by Major Carey Coombs, M.D., F.R.C.P. 291

CONFERENCE III.—Engineers and Surveyors.

Address by Sir Henry P. Maybury, K.C.M.G., C.B. 292

"The Hygiene of Road Pavements," by Ernest Worrall, F.S.I. 298

"The Evolution of the Road," by J. W. Willis Bund, C.B.E. 309

"The Local Surveyor," by T. G. Fisher 314

"The Conservation of Water Supply in England and Wales," by F. W. Macaulay, M.Inst.C.E., F.R.Met.Soc. 315

Supplement—

Article on Folkestone *57*

Congress Officers *66*

Reviews of Books. *68*

Meetings Held *71*

Forthcoming Meetings *73*

Calendar *75*

Elections *80*

LIST OF ADVERTISERS.

The numeral indicates the page on which the Advertisement appears; the dash (——) denotes that Advertisement is not in this issue.

Activated Sludge Ltd. xx
Boake, Roberts & Co., Ltd. ... xi
British Commercial Gas Association xvi
Building Products Limited ... xxi
Burn Bros. viii
Cadbury Bros., Ltd. vi
Candy Filter Co., Ltd. v
Cement Marketing Co., Ltd. ... xix
Claughton Bros., Ltd. ix
Colman, J. & J., Ltd. ... ... ——
Crapper, Thomas, & Co. viii
Educational Supply Association, Ltd. xviii
Glaxo v
Horlick's Malted Milk i
Hotel Metropole, Folkestone ... i
Hughes & Lancaster, Ltd. xiv
Jennings, George, Ltd. vii
Kerner-Greenwood & Co. ... vi
Lewis, H. K. & Co,. Ltd. xii
Manlove, Alliott & Co., Ltd. ... x
Moore's Hotel, Folkestone ... iv
Neave, Josiah R., & Co. xvii
Newton, Chambers & Co., Ltd. xii
O. Bruster & De Launoit iv
Phœnix Engineering Co., Ltd. ... xiii
Pudlo Cement vi
"Ronuk," Ltd. iv
Sankey, J. H. & Son, Ltd. ... xiv
Shell-Mex, Ltd. xiii
Silicate Paint Co. vi
Stimex Gas Stove Co. xv
Tintometer, Ltd. xv
United Alkali Co., Ltd. xi
Universal Accommodation Bureau iii
Wragg, Thos. & Sons, Ltd. ... vii

Particulars of the Arrangements for Advertising in the Journal can be obtained from the Offices of the Institute.

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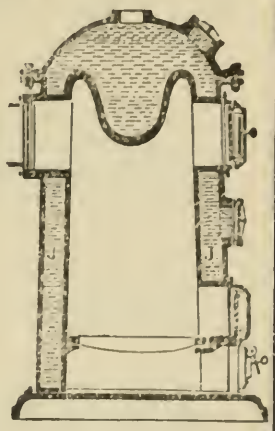

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JOURNAL

OF

THE ROYAL SANITARY INSTITUTE

CONGRESS AT BIRMINGHAM.

CONFERENCE I.—REPRESENTATIONS OF SANITARY AUTHORITIES.

Open-air Schools.

By Col. J. R. Kaye, M.B., C.M., D.P.H., Medical Officer of Health, West Riding C.C. (Fellow).

(Precis.)

Introduction—Object—Debilitated: physically defective: normal scholars. Definition of—Resident; non-resident *versus* school camps, nursery schools and sanatoria schools.

Classification and Selection of cases anent type of school.

Utilization of existing means (open-air class rooms, play-grounds, school journeys and holiday camps) *versus* special buildings in relation to cost and finance.

Essentials—requirements and regulations of the Board of Education.

Hindrances to their Establishment—delayed recognition of the inestimable and unlimited potentialities of fresh air and sunshine—Nature's disinfectants; inconsistent school environment; disregard of results *re* citizenship and vocation; bread and butter education; sprag of public opinion; old-world aphorisms.

Advantages for the "sound as well as the sick"; for those unable to keep pace with the normal; fullest relationship of mind, brain and body; introduction of new interests; medical supervision; no loss of school attendance; lessons communal; application to home life.

Disadvantages.—Delay till medical Inspection in School; early establishment of bad habits, *e.g.*, mouth breathing; removal (more or less) from home life and ultimate contrast on return from residential school; "buts" and "ifs" and avoidance of errors of the past in the new sweep of medical sociological work.

Dr. W. G. Willoughby (Eastbourne) advocated simplicity in construction and adaptation of buildings for open-air schools, describing the adapted army huts used in Eastbourne. He also stated that much ought to be done by improving existing schools, such as making the sides of class-rooms capable of being opened. Nearly every area could have an open-air school without much expense and the good results were almost immediately obvious.

Dr. Barwise (Derbyshire) desired to advocate floor heating for Schools, all of which should be open-air schools. In Derbyshire they had tried this in the sanatorium and are now adopting it in the Sanatorium Open-air Schools. They found that, with a floor temperature of 65° to 70° the children were perfectly comfortable in the coldest weather. They had warm feet and cool heads.

Dr. Auden (Birmingham) said, the value of the open-air school must be rather in the nature of object lessons as to what could be done by open-air education for an anæmic child. In Birmingham they had at least 20,000 children in need of open-air education. The provision of Day open-air schools for such a number was impossible. They must have a *crescendo* series ; (1) Playground classes and roof classes, Classes in parks ; (2) open-air class-rooms in existing elementary schools ; (3) Day open-air schools ; (4) Residential open-air schools.

The parents had now learnt the great value of the open-air school for their children, and large numbers of applications were received from parents. We know that, given sufficient food and warm clothing cold was the finest tonic to nutrition. One important aspect should be noted, the relation of enlargement of tonsillar tissues to the lack of open-air schools. In Birmingham 6,000 children were operated upon for tonsils and adenoids every year. This doubtless confers great benefit to the individual, but they must remember that tonsillar enlargement was a reaction to an infective process, and a cause must be sought and removed. There was no argument in favour of an open-air curriculum stronger than that provided by the increased incidence of enlarged tonsils and adenoids.

The Qualifications and Training of a Health Visitor.

By Professor Henry Kenwood, C.M.G., M.B., D.P.H., F.R.S.E., Medical Officer of Health, Stoke Newington, and Bedfordshire County Council (Fellow).

THE subject of the qualification and training of Health Visitors has been much discussed and the views expressed have differed in many important respects. It remains, therefore, a useful subject for further consideration,

Obviously the matter must be considered in strict relation to the nature of the services required. I maintain that in the larger towns these should be restricted to the hygiene of the mother and child ; but it must be recognised that in country districts and smaller towns the Health Visitor must often combine these functions with others—such as those of school nurse or tuberculosis visitor, and that in town and country alike she may be required, in epidemic periods, to advise in homes where measles or whooping cough occur. Therefore, to be eligible for most Health Visitor appointments, she should have some nursing training. An intimate practical knowledge of hygiene in its relation to expectant and nursing mothers, infants and children up to 5 years of age, and their environment, must be based on a good groundwork of elementary science and physiology ; and household management and elementary social economics form an essential part of her training.

She must know of the many helpful agencies with moral, charitable, health-promoting, educational, correctional, etc., objects, and by the study of their aims and methods, she will learn much concerning the problems of life.

The Health Visitor is engaged in work of high national value, and so she is recognised as rendering excellent services to the community, and for high quality results she needs high quality training. It is in the home that she is most tested, and there she will do well to bear in mind that if she is to make her maximum appeal she should *in the first place* observe and render some service, rather than ask many questions and preach hygiene. Whatever she does she must do aright, and then very soon the time will come when she can advocate hygienic practice with effect. Hence the necessity of an intimate knowledge of the sociological setting in which her work lies, and of a safe and sound practical training for appropriate and effective action therein.

To be successful she must bring to her knowledge the personal qualities which make for popularity and respect.

It is not too much to demand a full study-course of two years' duration for students who do not possess any substantial knowledge or experience of a special nature likely to be of value to them in their future work as Health Visitors ; and in respect of the latter class one year may suffice in most cases.

It is essential that satisfactory evidence of good general education should be demanded ; but I am not disposed to favour an entrance examination.

Too great demand must not be made in respect to nursing training. The nursing services of a Health Visitor are limited in their nature and extent, and three years' institutional nursing may even be disadvantageous. The nurse institutionally trained to the cure of disease is (like the medical practitioner) brought to think and act in terms of cure, and the prevention of disease and general hygiene are matters which are apt in her eyes to lose in importance and appeal ; this fact may help to explain why it is that the hospital nurse is more difficult to train for the hygienic duties of a Health Visitor than those who have not come under the hospital influence.

Much exception has been taken to the early age at which the Board of Education's Regulations permit of the training to commence, but surely, given similar personal qualities, a well trained young woman is better than a less trained elder one ; and, generally speaking, the best results in training are obtained when a start is made early in life, and the gap between school training and special training becomes as small as possible. But if she is only twenty when she gets her certificate, I admit that she is too young for full duties. I should recommend all certified Health Visitors to obtain the C.M.B. certificate ; and many Local Authorities would be prepared to pay a living wage to young Health Visitors who for a year after their training were willing to accept work of limited responsibility. The prospect of two and a half years' training and then a living wage for a year of further experience before receiving the full responsibilities and wage of a Health Visitor would not discourage a girl of 18 from taking up this work, having regard to the natural appeal which the work makes, the status it brings with it, and the remuneration attaching to it. If this demand seems great in relation to ultimate remuneration, it must be realised that in proportion as Health Visitors raise the level of their knowledge and effectiveness, so will the status of such workers improve and with it their salary. The expenses of the training period will deter many ; and so every training centre should endeavour to establish a loan fund to assist candidates in training.

I consider that the relation of the practical to the theoretical work during the two years of training should be in the following proportions :—For the first year, one-fifth practical and four-fifths theoretical, and for the second year four-fifths practical and one fifth theoretical.

It is desirable that each training centre should make arrangements with a selected Maternity and Child Welfare Centre at which each candidate may receive six months' training on at least three days a week ; and this training should include home visitations and reports thereon. If there is no existing centre prepared to afford satisfactory opportunities for the training of a limited number of such students, then the training centre should itself start a Maternity and Child Welfare Centre to supply this need.

Qualification and Training of Health Visitors.

By T. Eustace Hill, O.B.E., M.A., M.B., B.Sc., F.I.C., Medical Officer of Health, Durham C.C. (Fellow).

(Abstract.)

GOOD general education essential and a definite standard should be adopted.

Practical training in the work of health visitors necessary. At present practical training difficult to obtain.

Health visitors should hold the Certificate of the Central Midwives' Board, and have had some training in a children's hospital.

Full nursing training not essential.

A recognised examination on the duties of health visitors and in general hygiene should be passed. Certificates granted without examination after a course of training not a sufficient guarantee of efficiency.

Some knowledge of physiology and some practical experience in social work very desirable.

Trained nurses not qualified to act as health visitors without special additional training.

Candidates for training as health visitors to be not less than twenty-one years of age, of good physique, appearance, and manners.

Training of health visitor to cover a period of two years, the first year being largely spent in a maternity hospital and a hospital where experience in children's diseases can be obtained. Second year to be allocated to theoretical and practical instruction in health visitors' duties and work.

Desirable that health visitor candidates should be attached to a large public health department where facilities should be given to attend maternity and child welfare centres, school clinics, tuberculosis dispensaries, etc., and where they would receive training in food values, artisan cookery, practical housewifery and laundry work, clothing values and making of infants' and children's clothing.

Experience in the clerical work of a public health office very useful to a health visitor.

During the second year's training, if attached to health department, candidate might receive a small salary and after a few months' training, be appointed as probationer health visitor.

Urgent need for practical and theoretical instructions of health visitors in universities, science colleges, or technical institutes in convenient centres throughout the country.

Dr. Joseph Cates (St. Helens) said that, while there was much in the opening remarks made by Professor Kenwood with which those present would agree, he considered that a serious mistake would be made if it was decided blindly to follow the lead of the Ministry of Health and Board of Education along the lines of the regulations which had been issued for the training of health visitors. It seemed important to consider what was the sphere of work covered by women engaged in the public health service. The scope of the activities of health visitors had widened materially during recent years, so that now it was usual for a health visitor to carry out in her area maternity and infant welfare work, the visitation of certain cases of infectious disease, the following up of instances of defect found during medical inspection, the supervision of women outworkers, and attendance at maternity centres, school clinics, tuberculosis dispensaries and other communal services. There appeared to be many reasons why an attempt should be made to concentrate in one worker as much home visitation as possible. Too many mistakes had been made in the past by conducting the various branches of the public health service in water-tight compartments, In his opinion full training as a nurse in a recognised general hospital was the best foundation on which to build up a capable, tactful and well qualified health visitor, for in addition to the advantages to be obtained from attending medical and surgical work there were the advantages of attendance at special departments for diseases of the eye, ear, nose throat and skin.

No less important was what might be termed the non-professional part of the nursing curriculum. The probationer soon had to adapt herself to the life of the institution. She was taught to observe accurately, to report succinctly, to be careful and tidy in her methods, to be tactful and considerate to the patients, and she learnt discipline in a manner and to a degree impossible in a non-residential course of instruction. He was astounded when he heard it was seriously suggested that the hospital training of a health visitor might be condensed into a period of six or nine months in an institution. In that time a girl would hardly touch the fringe of hospital experience and would barely know how to take a temperature or make a bed. Where would they find institutions ready to cater for these peripatetic persons ? The whole routine of a training institution would be thrown out of gear were the doors to be opened to six months' probationers. The problem did not appear to be of difficult solution. If the general hospitals would provide a training of $3\frac{1}{2}$ or perhaps 4 years' duration, and during that time would give facilities for a nurse to obtain the certificate of the Central Midwives Board and possibly also, that of the Royal Sanitary Institute for health visitors, local authorities would soon have an adequate number of candidates for appointment, provided that the salaries offered were a living wage.

Health Visiting and School Attendance.

By Joseph Cates, M.D., D.P.H., M.O.H. and S.M.O., St. Helens (Fellow).

THE present position with regard to the exclusion from school of children living in contact with infectious disease is largely the outcome of the memorandum issued in 1909 jointly by the Board of Education and the Local Government Board. In that memorandum it is laid down as a general principle that all children suffering from any dangerous infectious disease should be excluded from school until there is reason to believe that they have ceased to be in an infectious condition.

Further, as it is seldom possible to provide effectual separation of the sick from the healthy within the homes of children attending the public elementary school, it is often necessary that all children of an infected household should be excluded from school. Firstly, because otherwise, such children if unprotected by a previous attack, might attend school while suffering from disease in a latent form, or at a recognised stage, and secondly, because it is known that infection of certain diseases may attach itself to and be conveyed by the throat secretions or clothes of a person living in an infected dwelling. The memorandum goes on to state that the action with regard to healthy children in the same household as the patient will vary in different instances. The usual procedure is to allow their return to school at an interval after the removal or the complete recovery of the patient, and disinfection of the house; the interval being a little longer than the maximum period of the incubation of the disease.

Up and down the country experience has been gained since the joint memorandum was published in 1909, so that now the procedure of local authorities in the exclusion of contacts varies widely in different areas.

It is usual in scarlet fever and diphtheria to follow the suggestions of the memorandum, and to exclude contacts for about two weeks, from the time when the patient is removed to hospital or from the end of the period of home isolation, although in diphtheria it is sometimes arranged for children living in the same house as the patient to return to school as soon as a bacteriological examination shows that the nose and throat are free from infection.

It is in the case of measles that the greatest divergency of action may be found. In some districts, only those contacts who attend the infants' department are excluded. In other areas the infants are excluded, together with those older children who have not had the disease; while in some localities, every child of school age coming from a home in which measles

exists is kept away from school. The usual period of exclusion is twenty-one days from the date of onset of the illness of the last patient in the house.

In whooping cough, steps similar to those adopted in measles are taken, but the period of exclusion may be as long as six weeks.

In mumps, chicken pox, pulmonary tuberculosis, erysipelas and enteric fever, the exclusion of contacts is generally not enforced.

The supporters of a policy of rigid exclusion of all children of school age living in a house in which dangerous infectious disease occurs, argue that so long as there is a risk that a contact may carry infection to the school, or may develop the illness while in attendance there, it is a reasonable precaution to exclude until the danger has passed. Further, it is said that compulsory exclusion of contacts impresses parents with the importance of certain infectious diseases, which they might otherwise regard as trivial.

By the opposite side it is urged that there is only a remote possibility of infection being conveyed to school on clothing, that any advantage attaching to the exclusion of contacts is largely diminished by absence of control over the movements of the child while excluded, that the loss to the child in education, and to the authority in grant, more than balance any gain to public health, and that dangers of infectious disease can be brought home to parents more effectively by home visitation than by excluding contacts from school.

In St. Helens, in March, 1919, arrangements were made, on the advice of the medical officer of health, for nurses to visit daily each class in every school. The primary objects being the detection of the beginnings of disease, and the provision of advice and early treatment. The borough, having a population of about 100,000 persons, was divided up into twenty areas, each containing one or more schools, with an approximate total of a thousand children in attendance. A nurse was placed in charge of each district, and therein acted as health visitor and school nurse, in fact, carried out the public health duties for which a woman is specially qualified.

During the morning session the nurse enters each class, examines the attendance register, and fills in a card for every child absent for more than two days. The class is then rapidly surveyed, and a careful examination is made of any child that appears to be ailing, or concerning whose condition the teacher is anxious, and particularly of those coming from homes in which infectious disease exists. During the visit, the nurse confers with the head teacher respecting any action arising out of the inspection.

The cards relating to absentees are distributed among the nurses in whose district the children live, a home visit is made, usually within twenty-four hours, and a report is entered on the card which is returned to the nurse

who in the first place made it out. The class teacher is thus able to obtain, within a reasonable period, an authoritative report by a trained nurse, who has seen, and in most cases examined, the absentee.

In certain of the schools remote from the clinic it soon became necessary to provide first aid outfits so that cuts, sores and trivial ailments could be treated by the nurses on school premises, with the result that children who would otherwise have been kept at home untreated, were sent to school.

This system of daily nursing supervision seemed to be sufficiently comprehensive to allow for the regular attendance in school of all children coming from homes in which there was infectious disease, and, as an experiment, the exclusion of contacts was discontinued. At the time this scheme was put in force there were only a few children excluded from school on account of contact with infectious disease, in fact, only some fifty children who were then excluded were re-admitted to school.

During the fifteen months that the scheme has been established, there has been evidence of success, which may be tabulated under five headings.

(1) Immediately the daily visiting of schools was put into operation there was a noticeable improvement in the appearance of the children. They came to school cleaner in person and more tidy in clothing. The knowledge that a nurse would be present in the class room during the morning seemed to make the children vie with one another in personal cleanliness. Parents at once began to seek the advice of the nurse regarding minor ailments and other conditions. It was found that the children soon looked for the nurse's visit, and often themselves volunteered information concerning their health and home circumstances.

(2) The daily visit of the nurse to each class is very helpful in the following up of defects discovered in systematic medical inspection. The defects are treated more quickly, the spectacles provided are worn more regularly, and when broken are more promptly repaired. Generally the nurse is able in a multitude of ways to attend to the health and comfort of the children, to watch for minor maladies, sick head-aches and feverishness, and to advise the teachers to send home children who should not be in school.

(3) Contrary to the expectations of those who opposed the innovation, the experiment of allowing contacts to attend school does not seem to have been a menace to public health. It so happened that the usual two-yearly epidemic of measles appeared in autumn of last year, but, for the first time on record, the outbreak of measles did not gain a foothold in the public elementary schools, nor has there been any evidence that scarlet fever or diphtheria has been spread in school through the agency of contacts.

(4) Possibly the most striking feature of the change has been the persistent improvement in the average percentage attendance. This improvement is doubtless due in some part to the presence in school of children who, under the old arrangements, would have been excluded, but the fact that when the scheme was begun there followed immediately an increase in attendance, although at the time only about fifty contacts were re-admitted to school, seems to show that there are other and more important reasons for the continued improvement in attendance.

It would appear that the daily visit of a nurse to the schools leads parents to send there, children having minor ailments and other trivial affections, who would previously have been kept at home. It is more than likely that the home visit of a nurse, as soon as the child has been absent from school for two days, tends to check the keeping at home of children on fictitious medical grounds.

(5) The increase in average percentage attendance leads to an increase in Government grant. In St. Helens, for the year 1919, it has been calculated that about £1,800 was earned in this way.

It would seem, therefore, that, both on health and educational grounds, there are sound reasons for giving the experiment a trial in areas other than that in which it is now in operation.

Pollution of Streams by Waste from Cheese and Milk Factories.

By Arthur F. Somerville, J.P., Somerset County Council (Member).

ONE of the results of combination amongst farmers has been the large increase of milk taken by Milk Factories for manufature into Cheese, Milk Powder, and other products from Milk. These factories, when first started, as a general rule, made no provision for dealing with the waste or drainage caused by any process of manufacture. If a stream was near that was looked upon as the natural method of getting rid of anything likely to be a nuisance to the factory; or, if no stream had been provided by Nature, there was generally some road drain into which it could be emptied, and road drains were bound to discharge somewhere. Consequently from the first, these milk factories have been a cause of annoyance and pollution, but in many instances the volume of waste at first was hardly sufficient to raise public protest, and many members too of the Sanitary Authority were directly interested in the prosperity of the factory, and

therefore not anxious to put the managers to extra expense by dealing with the waste. The output of these factories has however increased, and is increasing so enormously that the pollution, and consequent damage caused by it, has become such a serious matter, that it is imperative on Local Authorities to take action. As in other cases of damage caused by waste from factories, it is possible, however, that, as to a large part of this waste, bye products can be obtained, which will more than compensate the manufacturers for the necessary plant requisite for their production.

From separated milk by evaporation, milk powder can be produced, and, though more expensive machinery is required for the treatment of whey, from it lactose a most valuable bye-product can be obtained. There remains the question of how to deal with the washings of the milk " churns " utensils and floors. It is absolutely wrong to allow this " waste " to pass untreated into drains or running streams. The process of purification should therefore be undertaken in the factory before discharge. By discharge into a stream an improper and premature start is made in the process of purification, and lactic fermentation is encouraged. After purification the process of natural oxidation by nitrifying bacteria can be put into operation either on filter beds or by irrigation over grass land.

This latter waste must however be considered, as regards its treatment, as part of the necessary working expenses of the factory.

Some difficulties have arisen in certain localities in consequence of District Local Authorities having allowed waste from these milk and cheese factories to pass untreated into common sewers. I suggest, however, that the character of this sewage is so detrimental to the treatment of the rest of the sewage dealt with by the Local Authority, and its bulk in many cases so much in excess of the ordinary volume of sewage to be dealt with, that the Local Authority should call upon the factory either to disconnect its sewage from the public drains, or else submit its sewage to such primary treatment as will render it innocuous to the treatment of the rest of the sewage.

The matter is so important, and likely to become of still greater importance, that I would suggest that it is a matter well worthy of consideration with a view to concerted action being taken by Sanitary Authorities in Districts where this source of pollution is present

CONGRESS AT BIRMINGHAM.

CONFERENCE II.—MEDICAL OFFICERS OF HEALTH.

Presidential Address by JOHN ROBERTSON, C.M.G., O.B.E., M.D., B.Sc., Medical Officer of Health, Birmingham (Fellow).

A NEGLECTED ASPECT OF HOUSING.

MY first duty as President for the day is to offer you some observations on a subject which I am permitted to choose for myself. Medical Officers of Health might expect me to deal with such a subject as "The future provision of medical and allied services," but I think this is not the time to review the recently issued report, which will doubtless form the subject of a debate in which all may take part.

More important from my point of view is the fact that the provision of medical and allied services is less important at the present time than the housing question. The former can wait with less disastrous results than housing improvements, and I am, therefore, going to occupy the short time at my disposal in giving you some thoughts on what I regard as a neglected aspect of housing.

As one who is getting old in the Public Health medical service, I would say that I am more convinced than ever that the way of improving the health and morality of the people is to give the great mass of them living in our large towns decent conditions of housing. This has never yet been attempted for the old parts of any of our towns.

I am well aware that for the past thirty or forty years the real hindrance to proper housing has been the reluctance to spend money on it, with a result that no material progress has been made with the remodelling of the slums of great towns. By far the largest part of the improvements already made in slumland is due to clearances for railways, for warehouses and for business purposes.

Considering the number of Royal Commissions, Departmental inquiries, local investigations and the number of lectures and books, Congresses and addresses which have been given on the housing question, it is somewhat remarkable that to-day there is no clearly defined policy as to what is needed to make the slums of our large towns more wholesome to live in, and I am inclined to think that unless the large town population is kept in mind it

will be neglected when the time for reckoning expense comes in regard to the present new buildings.

The housing question to-day may be divided into three sections :—

1. The provision of new houses to make up the present shortage. I think all will agree that this has been taken in hand on fairly good lines. It is doubtful, of course, whether the present method will enable the deficiency to be caught up and whether the costs of the present process are not prohibitive. It would be interesting to know how many officials have been appointed in connection with the building of the houses which are in contemplation.

2. Then there is the supply of houses for rural labourers. This is a most difficult subject, because it is not obviously economical. Yet there is nothing more important in the whole of our country than the getting of the people on to the land by giving them comfortable houses to replace many of the unwholesome hovels which now exist, as well as to give them many more houses than exist at the present time. I do not understand why country doctors do not do more in the way of exposing the evil conditions under which the labourers have to live in some bad parts of rural England. They, of all men, know these houses better than anybody else.

3. There is the slum part of the large town, which must be reconstructed, and there is the small town which is likely to become a slum in parts, but which must be prevented from becoming so. It is to these latter questions I apply the name I have given to this paper, viz., " A neglected aspect of Housing."

So far as the central areas of the town are concerned we have devoted far too much time to the minimal requirements of houses for the poorest class of labourer. I am satisfied that in the majority of towns we have arrived at proper standards, so far as the dwelling itself is concerned, and I have nothing to add as to what has already been done.

The replacement of the existing bad dwellings by minimal labourers' cottages will not greatly benefit the inhabitants of slumland. For the most part the existing houses, good and bad, are surrounded by factories, workshops, beer houses and all sorts of industrial premises. The atmosphere is sooty, vegetation will not live, the clothes the people wear will not keep clean, the inside of the dwelling house cannot be kept clean, the occupants look out of the window upon soot-begrimed buildings—often on to the conveniences—there is little or no privacy, there is no reasonable playground for the children to exercise themselves in, there is no suitable place for the old people to take the air—all is hideously ugly and dirty, and there is crime and wickedness all around.

Is it fair to allow these conditions to continue at any cost ? It is just these conditions which produce the C.3 corner men who are so difficult to deal with.

There are many children in the centre of Birmingham, who seldom or ever see a green tree. There are a large number of boys and girls who never get into the country until they are 10 or 12 years of age, and are able to walk four or five miles. There are many of the women and old people who cannot go out and sit in the sun and see a pleasant place anywhere nearer than a mile or two from their dwelling. I think it is perfectly wonderful that we get so many decent self-respecting men and women coming out of the slums, and I am certain that under good conditions very many more would become self-respecting.

My experience among the slum dwellers leads me to hope for a vast improvement in the near future. Public Health Departments in all our great towns have been working for many years and have not been working in vain. The most beneficial part of their work has been the direct or indirect education of the people in Health matters. I am convinced that in Birmingham we have amongst the slum dwellers a large number who are desirous of better conditions, and but for the War there would have been in the city to-day many fewer occupied slum houses than there are. There has been a great desire to get something better.

The question is a very large one. We have, for instance, in Birmingham between 200,000 and 300,000 people living in conditions which must be prejudicial to health and morality. The demolition of a few dozens or a few hundreds of houses here and there in the centre of the city is not going to affect materially these 300,000 people, and, therefore, one must deal with the question on much larger lines than are contemplated in the Housing Acts at present.

I believe it is as necessary to make a town plan of the central areas of our great towns as it is to make a town plan of the unbuilt-on areas. Such a town plan would, of course, differ considerably from that of undeveloped land. I would suggest that the town plan should define areas where factories should be placed, and areas where residents should be concentrated. In this way, in course of time, it might be possible to separate the smoky portions of a town from the residential portions. It would be impossible to attempt to make a transformation at once, but this could be done by requiring that no new dwelling house should be built in an area set aside for workshops, and that no factories should be placed in an area set aside for dwellings. Having defined these two groups of areas, much could be done to facilitate manufacturers taking their factories into the factory areas by giving those in such factory areas preferential rates for electric and gas power and for transport. This would, at the same time,

vastly improve the atmosphere of the town by making it possible to use these clean forms of power in place of the older and sootier steam engine.

It will be possible, too, to concentrate one's efforts upon the residential areas. Probably, the first thing that will be necessary will be to purchase spaces which can be set aside for recreation and pleasure. In many cases tree planting in the streets will be possible, and, generally, the beautifying of the residential portion of the town can be made absolutely secure. I am inclined to think that the insanitary dwellings on such an area should be dealt with under Part II. of the Housing Acts, and that there is sufficient power to require an owner to bring the dwellings up to a reasonable standard. The central area of a big town changes very rapidly, and if the changes are made to conform with a good plan it will be possible to provide a healthy environment for dwellings. It will not, of course, be possible to do as much as one would wish in the suburban areas, but it ought to be easily possible to make a pleasant place to live in. We cannot say that the central areas of our manufacturing towns are such at present.

The process will undoubtedly reduce the number of residents in the central areas. In a suburban area where manufactories and houses are mixed up together, probably an average of 20 persons per acre is about as much as it is safe to accommodate. In a central area where the residents are accommodated in one of the special residential areas which I have described above, double this number of persons per acre might be provided for. In the poorer parts of Birmingham we have from 80 to 100 persons per acre, and in addition to these persons per acre we have a very large number of smoky, dusty, fume-emitting works, so that present figures for density are misleading.

I am, of course, cognisant of the need for getting the homeless people of this country housed at once, but *pari passu* with this housing of the homeless we ought to be considering the question of dealing with the central slum dwellers, and also the question of preventing such areas ever being possible in the smaller towns. It will obviously be impossible to do much for slumland for some years, but it is possible to begin getting the Town Plan ready so that it may be available whenever the opportunity arises.

After-care of Patients suffering from Consumption.

By H. Gordon Smith, M.A., M.B., D.P.H.(Camb.)., Medical Superintendent, Knightwick Sanatorium, Chief Tuberculosis Officer, Worcester County Council.

A THOROUGH system of After-Care is bound to be costly, but if it helps to bring back to some working capacity a fair proportion of otherwise invalid lives, and also helps to prevent infection, it should be considered as money well spent.

After-Care may be conveniently divided into :—

I. Medical.
II. The supplementing of any deficiency in food.
III. Provision of better sleeping and living accommodation.
IV. Provision of suitable employment.

I. Medical.

Dispensary and Domiciliary treatment and Nurses' visits, principally symptomatic and advisory, with the view of obtaining the best arrangements at home and the prevention of further infection.

II. The Supplementing of any Deficiency in Food.

An attempt to supply this want has been made in most localities, but the funds (almost entirely voluntary except for ex-service men) are generally inadequate. In Worcestershire there is a small fund for this purpose, and as it was so small, a rule was made that grants should only be made to those cases who, after Sanatorium treatment, were able to do some work and were likely to get better, but humanitarian sympathy is a very strong force, and this rule is not adhered to, advanced cases receiving help. It is really waste of funds to give to those who cannot under any circumstances get better. Here I might say that butter should not be given when margarine, which is just as nourishing, is so much cheaper.

The most important item of course for the prevention and cure of consumption is to get the general cost of living down as quickly as possible. A general increase in wages hits the consumptive who cannot do a fair day's work more than anything, as his wife has to compete in the purchasing market with people who have plenty of money.

III. Provision of Better Sleeping and Living Accommodation.

Most Tuberculosis Committees have provided a certain number of Shelters. In Worcestershire we have 40, and these are used as far as

possible for infectious cases, especially where there are young people at home.

These shelters are rather too heavy and substantial, necessitating a large cost in removal. A lighter type possibly of asbestos sheeting on frame work would be more economical.

VI. Provision of Suitable Employment.

This is the most important and, at the same time, the most difficult problem, and I believe very little headway has so far been made towards its solution.

The subject may be considered under :—

(*a*) Work amongst the general population and

(*b*) Work within the precincts of an Institution or Colony.

I think it may be taken for granted that all patients would prefer to live under (*a*), but for several reasons (*b*) would be desirable for many cases.

To take some of the difficulties to be contended with under (*a*).

(1) Competitive labour is highly undesirable for genuine consumptives whose health is in a state of unstable equilibrium.

(2) Commerically minded employers are naturally against employing partially fit men ; they could not economically pay them the ordinary wage for time work, and on piece work a consumptive would probably be unable to earn enough to keep his health. Philanthropic employers have been taxed practically out of existence. Single handed jobs are more likely to suit than a position as one of several healthy employees, as the presence of one light working man is apt to have a very bad moral effect on the others, also risk of infection is very likely to be put forward by some of his co-workers.

(3) There seems to be an inherent disinclination to work by most consumptives, engendered partly by the necessary restriction on energy during any activity of the disease while in the Sanatorium, and partly by the fear of losing pension amongst the service men.

(4) *Trade Unions* cause much trouble, and it is difficult to understand how workmen belonging to a free country put up with such slavery—it is their own class that is hurt most.

(5) *The Minimum Wage* has, too, done much harm by upsetting the basic principle of supply and demand.

(6) With the present dearth of houses it is more difficult for a man, especially if he has a dependent wife and family, to move to the neighbourhood of any available work.

To quote a few of the jobs suitable for patients outside a Colony which occur to one :—

Insurance Agents, Rent and Gas meter collectors, Caretaking, Door-keeping, Care of horse and driving round for orders, etc., Chauffering may

be quite heavy work and is rather overstocked with men at present—old A.S.C. drivers. Staff at a Sanatorium.—I know opinions differ on the advisability of taking on ex-patients as probationer nurses. Personally I am quite in favour of employing quiescent early cases—non-infectious being a stipulation if they have to be housed and boarded with other healthy nurses. Open-air School teachers *if non-infectious*. Ticket collectors, Light Porters on railways, and Tram Conductors are suitable, but if they are pensionable billets, would only be available to old servants of the company. I think any Post Office work would likewise be debarred to new tuberculous applicants. The manufacture of cheap jewellery. It is a pity that such a trade, the products of which command a ready sale, and yet are not of vital importance to the country, cannot be earmarked in some way for consumptive labour.

It should be remembered that a new occupation generally means comparatively harder work and more mental worry than one's old occupation, especially after 30 years of age, also that a change to a healthier country occupation from a confined town trade generally of itself implies a drop in wages. Also remember that country occupations generally require much more muscle than town work, and that the village idiot would probably be worth a bigger wage as ploughboy than a well educated clerk.

Occupations involving the handling of foodstuffs should be barred to definite consumptives. Legislation to this end is needed. At present one has no power to stop a consumptive, who is coughing up millions of Tubercle bacilli, doing a milk round !

In discussing future occupations with patients at the Sanatorium, I have been much struck by the general desire for a *change of occupation.*

The mention of work seems to be looked on by some men with suspicion as being the first step towards reduction of pension. No one grudges or would wish to reduce the pensions and treatment allowances granted to really disabled consumptive soldiers, they are often given too readily to some indefinite cases who might, with advantage to their own well-being, do some useful work, and in this way are engendering a spirit of ergophobia.

No Scheme for the employment of consumptives can hope to be run on economic lines; there must be financial assistance from some source, and on reviewing the evident difficulties in the way of genuine consumptives obtaining suitable and remunerative work in the open labour market, one becomes more and more impressed with the idea that the only possible scheme is for the Government to become the main employer of tuberculous labour and to run colonies and village settlements on communal lines, sending in a bill (perhaps half the cost) to the Local Authority for every consumptive and family taken off their hands.

The full discussion of a village settlement and its inner working would be too large a subject to start on. Suffice it to say that the more important items would be :—

(1) An open-air School.
(2) A Hospital for the advanced and any acute cases with
(3) An adjoining house for the Doctor.
(4) A communal kitchen worked, for payment, by the wives of the tuberculous men. Meals could be taken at the kitchen, if some covered verandahs were provided, or taken home to eat. Each family would be provided with coupons, and the balances worked out against any work done, a sufficient grant being made where necessary to provide a little pocket money for amusement. The clerical work would be done by consumptive clerks.
(5) A Laundry, with disinfector, sputum destructor, and refuse incenerator.
(6) Accommodation for religious services.
(7) Arrangement with some burial authority near by.
(8) Amusement Hall, Bowling green, etc.
(9) Healthily built factories could be started as occasion for fresh occupation arose, but some of the earlier ones should be for boot and shoe making, tailoring, carpentry and furniture making, Tinsmiths' shops for making and repairing cooking utensils, and many other articles which would be required in the village itself.
(10) Poultry-farm, Pig-keeping, Bee-keeping and market-gardening would of course give a good deal of employment. A house repairing and decorating gang could be kept permanently in existence.

A village settlement should be so designed and organised as to attract and keep patients in all stages of definite tuberculosis.

The cottages should be built with accommodation to house safely families with an infectious member, and every endeavour should be made to get these families to reside in the village so as to remove infection from the general public. Public opinion in England will never allow legislation for compulsory segregation of consumptives.

Training Colonies, as distinct from Village Settlements, should be used chiefly for those non-infectious quiescent cases who are likely to be able to hold their own and support themselves in the outside world after learning a more healthy occupation than that they originally followed.

All cases should spend a certain period in some Institution : hopeful cases at a Sanatorium. As soon as the disease becomes quiescent and is

non-infectious, the patient can be drafted to a Training Colony. If it becomes evident that we are dealing with a permanently crippled life, he should be advised to gain admission to a Village settlement, and, after a reasonable trial by rest to obtain quiescence, he should be encouraged to work as much as possible ; even if it may mean some shortening of life, his existence will be all the happier for having had some occupation. I have the strongest objection to the patient one sometimes meets with who tells you that his doctor has told him he must never do any more work but must lead the life of a gentleman !

I feel very strongly that a greater distinction should be made between cases with positive sputum and those without tubercle bacilli. This division gives a much more accurate forecast as to the future than the 1st, 2nd, and 3rd stage Turban Gerhardt and would help more towards measures for the prevention of infection.

Of the 486 positive cases treated at Knightwick Sanatorium during 1914-1918, as many as 260 (54·5 per cent.) were dead in 1919 (*i.e.* in from 1 to 5 years after), though Knightwick Sanatorium is intended for the earlier and more promising cases. Of the 826 cases without tubercle bacilli only 70 (14·4 per cent.) were dead within the same period.

It is not economical to give a long and costly training to positive tubercle bacilli cases, as the average length of life is short (3 to 5 years). These are the cases especially suitable for Village Settlements where *some* occupation could be found for them so long as they remain fit for anything. It would in the long run be economical to the State to pay these cases sufficient to make them willing residents in a properly conducted Village Settlement.

Domestic Animals as a Factor in the Spread of Infection.

By William G. Savage, B.Sc, M.D. (Lond.), Medical Officer of Health, Somerset C.C.

REAL progress in the prevention of the spread of infectious diseases—using the term in its widest sense—can only be attained by an extension of exact knowledge as to the paths and methods of infection and the factors affecting the resistance of the individual. This truism is worth restating since it is so frequently neglected in practice. The present discussion only deals with one small aspect of this huge problem, but it is one upon which we need to come to clear and definite conclusions and to decide precisely to what extent, and how, domestic animals are factors of spread of infectious disease to man.

It would be impossible for me to give even a general survey of the subject in the time at my disposal, Tuberculosis alone could occupy us for a day, so I propose to take three examples of alleged association between human and animal disease, leaving it to others to discuss other aspects of the subject. They are selected because I have devoted many years of investigation to them, and illustrate very well the need for exact knowledge which can only be acquired by prolonged investigation.

Bovine Mastitis and Human Disease.

Mastitis in cows is a rather common condition, and it is important to know definitely how far it is a menace to health. My own investigations and those of other observers show that it may be caused by a number of different bacteria. The chronic form is usually due to the tubercle bacillus or less commonly to actinomycosis. There is considerable discrepancy amongst authorities as to the prevalence of cows with tuberculous udders. There are evidently considerable differences according to the district. Probably the average prevalence is about 1 per cent. This is the most important source of tubercle bacilli in milk and a potential cause of human tuberculosis.

The association of the acute variety with human disease is far less direct and has required a good deal of unravelling. Of 35 acute cases which I investigated very thoroughly for the Local Government Board in 1907-08, over 70 per cent. were due to streptococci, the remainder being due to staphylococci (over 16 per cent.), one to *B. coli* and the others were of doubtful bacteriology. The point of practical importance in the present connection is the extent to which these streptococci and staphylococci are capable of causing human disease when ingested in raw milk. Since it is by no means

infrequent for the milk from animals affected with acute mastitis to be added to the common supply and used for human consumption, I made an extended study of the streptococci from mastitis cases. The *streptococcus mastitidis* very closely resembles the pathogenic streptococci of man, as found in cases of sore throat and from other sources, in morphological and cultural characters, but in my experiments differed in pathogenicity. This bovine type was of low virulence to animals but readily set up mastitis in goats. The human strains possessed considerable pathogenicity for laboratory animals, but 13 out of 15 strains were unable to produce mastitis in goats when introduced by way of the teat canal. The remaining two strains did produce some degree of mastitis in the goat. These results showed the striking and distinctive fact that there was an essential difference of function separating the two groups, and that it could be deduced that under ordinary conditions the *streptococcus mastitidis* is not a cause of human disease. So convinced was I of the accuracy of this deduction that on two separate occasions I infected my own throat with massive doses of this streptococcus, isolated only a day or two previously from cases of cow mastitis. On both occasions no ill effects were experienced constitutionally or locally, and the streptococcus could only be recovered with extreme difficulty from my throat, showing that it was a type of organism in an alien habitat.

While my extended investigations conclusively demonstrated that the ordinary case of bovine mastitis was not a cause of human disease, it left unexplained the undoubted fact that from time to time extensive outbreaks of sore throat and other septic conditions had been traced to milk infected from cows suffering from mastitis. In my book on " Milk and the Public Health," published in 1912, I summarised particulars of over 20 outbreaks of these diseases due to milk, in a good many of which the cause was traced back to cows suffering from this condition, while in 1905 I had described in detail, and fully investigated, such an outbreak involving over 600 cases and definitely traced to such an infective cow.

I was able to supply an explanation of this apparent inconsistency. While I found that *streptococcus mastitidis* was the usual organism of bovine mastitis, it was not the only type of streptococcus associated with this condition. In one case, for example, a streptococcus of extremely high virulence to rodents was found to be the cause of the mastitis, and of a type which was distinctive from the *streptococcus mastitidis*.

In a paper I read in February, 1911, before the Epidemiological Section of the Royal Society of Medicine I advanced the view that the ordinary type of bovine mastitis is due to organisms non-virulent to man, but that in certain uncommon cases this condition is caused by streptococci highly pathogenic to man. In the same paper I propounded the hypothesis that

the cases in which this type of organism occurred were examples of infection of the cow from a human source. To quote my words: "Briefly stated, I regard the bovine udder and teat lesions, as commonly met with, as of purely bovine origin and, as such, harmless to man. Occasionally, either as an invasion superadded upon the original bovine lesions or as a primary infection of the milk organs, there is a local infection with organisms of human origin. In such cases the conditions present may be decidedly prejudicial to man. In other words, the cow, in this class of infection, is only potentially pathogenic to man when it acts as an active or passive carrier of organisms of *human* origin."

These investigations and views were contained in papers written between 1907 and 1911. At that time there were no recorded outbreaks of sore throat, etc., reported in America, but in 1911 and subsequent years a number of extensive outbreaks occurred in Boston, Chicago, Baltimore, and other cities which led to an extended series of careful investigations in America which are of great value and have considerably increased our knowledge. They have, for example, been able to further differentiate the human type of streptococcus in bovine mastitis by means of hæmolytic tests, and have shown that the strains dangerous to man are always hæmolytic, while the streptococcus of ordinary bovine mastitis is non-hæmolytic. Davis and Capps have shown that hæmolytic streptococci of human origin may cause mastitis lasting for several weeks in cows, this time roughly corresponding to the duration of milk-borne epidemics. The streptococci may gain access from an infection from the milker, whose hands are contaminated, perhaps, from a sore throat.

By means of the tests advocated by me and these additional tests it is possible to state with reasonable exactitude whether particular strains of streptococci isolated from the udders of cows are of the human pathogenic type or are of the comparatively harmless bovine type.

In an outbreak in Boston in 1917 (reported January, 1920, by Brown and Orcutt), it was possible to identify the particular infective strain both from the mastitis fluid and from the sore throats of the sufferers. An endeavour was made to trace the source of infection of the cow, and this particular strain was isolated from the throats of a number of the employees of the dairy, but the data was insufficient to connect any one of these individuals definitely with the infection of the cow.

These American results afford very striking confirmation of the hypothesis described above, enunciated from my own investigations, and long before any of the American work was carried out. The precise relationship of this condition to human disease may now be said to be worked out fairly clearly.

Food-Poisoning—Outbreaks and Domestic Animals.

We now possess fairly exact knowledge of the relationship of unsound food conditions to individual cases and extensive outbreaks of food poisoning, but this knowledge is not widely disseminated while certainly it is not usually acted upon in administrative work. It is therefore worth while defining clearly the present stage of our knowledge.

We may accept it as definitely established that all, or almost all, the outbreaks involving groups of persons and probably most of the smaller outbreaks involving only a few individuals, are due to an infection of the food eaten with members of a particular group of bacilli, the Gaertner group, the infecting bacilli being either *B. enteritidis*, *B. suipestifer*, or *B. aertrycke*. The actual source of infection of the food is, in the majority of cases, not *intra vitam* from infected animals, but through secondary infection of sound food. In a minority, but still a very considerable proportion, it is due to infection of the living animal with one of these bacilli.

For the latter group of cases we need to arrive at an accurate conception of the nature of the diseases and conditions affecting domestic animals which may render them liable to originate outbreaks of food poisoning. Even yet we cannot answer this question with precision, but we do know a good deal about the conditions, both which do not and which do render the meat or milk a source of acute food-poisoning outbreaks.

Amongst those which do not we must place first, on account of its great administrative importance, tainted and putrefactive food. That such food causes attacks of food poisoning in individuals is usually assumed but the evidence is most unconvincing, and that it cannot originate widespread outbreaks is practically certain. To produce such outbreaks the food must be specifically infected with a member of the Gaertner group, and these organisms are not a cause of tainted food.

Apart from secondary infection of the food in course of preparation for sale or consumption, the only direct source of infection from an animal used for food is either when it is suffering from some form of disease associated with this group of bacilli or is acting as a carrier of these bacilli.

In only a few of the recorded British outbreaks is there direct evidence of disease in the animals supplying the peccant food. In several cases where milk has been the vehicle the condition has been traced back to infection of the cow with a member of the Gaertner group. The only two instances which I have been able to trace, spread by meat from a diseased animal, are those at Murrow and at Limerick. On the other hand, the continental outbreaks show this association much more frequently.

Animals used for food undoubtedly may be infected with these bacilli, the pathological conditions found being commonly gastro-enteritis, udder

disease, puerperal sepsis, and local abscesses. We require a good deal more exact information as to the etiological association of these diseases. I have made a number of examinations but lack of material has limited my opportunities.

We have also to recognize that animals suffering from Gaertner group infections may recover from such conditions, but the bacilli persist, the animals acting as carriers, and undoubtedly a number of outbreaks have originated from the meat of sound animals being infected (by splashing, etc.) from the intestinal contents of such carrier cases.

I think I may claim that my protracted investigations carried out for the Local Government Board over ten years ago have completely refuted the idea which originated in Germany, and which was widely accepted when those observations were made, that these bacilli are normal intestinal inhabitants. The extensive work carried out since in this country, America, and Germany has fully confirmed these investigations.

In connection with the question of the secondary infection of food the importance of rats and mice must not be overlooked, since these animals frequently are infected with Gaertner group bacilli, and such infected animals, or those who have recovered and still harbour the bacilli, may act as a vehicle of infection.

It is therefore possible to have clear ideas as to the extent to which the domestic animals used for food may serve as a cause of food-poisoning outbreaks, and the lines along which we must institute our inquiries when they occur.

DIPHTHERIA AND CATS.

That cats may be attacked with human diphtheria, or act as carriers of the bacilli, and so spread this disease, is a view very widely accepted amongst medical men and in the text books.

Time will not allow me to discuss the experimental and other grounds for this view, and I must refer inquirers to my paper, published last February in the *Journal of Hygiene*, which deals with this and with my experimental work. This view has been kept warm and received considerable support from the reports published by Medical Officers of Health and others as to the finding of diphtheria bacilli in the throats of cats associated with cases of human disease.

My investigations were along three lines. The examination of the throats of healthy cats and kittens quite unassociated with cases of human disease showed that in the swabs from the latter no organisms like diphtheria bacilli were detectable, but that from no less than five out of eight healthy cats bacilli were found growing on the cultivation media, which, morphologically, very closely resembled diphtheria bacilli, and which could not be dis-

tinguished from that organism in the films from the cultures. One cat re-examined three months later still showed these organisms. When they were isolated and their characters studied in pure culture, it was manifest that they were *not* true diphtheria bacilli, nor were those tested pathogenic.

All the cases mentioned above, where diphtheria bacilli were reported as found in the throats of cats associated with human disease, rested upon morphological appearances alone and never upon isolation and identification, and, therefore, are completely valueless in view of the above findings.

My second line of enquiry was the examination of cats actually closely associated with human cases of diphtheria, and here, in several instances, as might be anticipated from my findings in healthy cats, bacilli morphologically indistinguishable from diphtheria bacilli were found in the cultures from the swabs. When isolated and fully investigated, however, none were found to be true diphtheria bacilli.

The third line of investigation involved the experimental inoculation of kittens, to see if it was possible to infect them with diphtheria bacilli by natural channels. As many as 19 different experiments were carried out, and 10 different strains of human diphtheria bacilli were used, the virulence of 4 of them being fully tested.

Massive and repeated feeding with highly virulent cultures (in one case on 11 occasions) were quite without effect. Kittens whose throats were inoculated by swabs with enormous numbers of diphtheria bacilli, either alone or mixed with staphylococci and streptococci, grown direct from human cases of diphtheria, remained unaffected, and the bacilli had disappeared within 24 hours. The possibility that the failure to infect the kittens was due to the absence of a local nidus of growth was met by creating such a nidus by a preliminary scarification of the throat, and with other animals by painting with strong silver nitrate solution. Subsequent massive inoculation with diphtheria bacilli still failed to produce any infection or, what was remarkable, any persistence of the bacilli locally. The same striking fact was brought out by a series of nose-swabbings with heavy doses of diphtheria bacilli. In every instance the bacilli rapidly disappeared, and neither local nor constitutional symptoms resulted. These results were exceptionally uniform and concordant. It was found impossible either to infect the kittens or produce a carrier condition, even one of very short duration.

The whole series of experiments justify the opinion that the common and widely accepted view that cats can suffer from a naturally acquired disease caused by the diphtheria bacillus is entirely without foundation. The reported cases of such an association are based upon insufficient examination and differentiation of the bacilli found, due to a failure to realize that a large proportion of healthy, normal cats contain in their throats bacilli

which closely resemble, and are difficult to distinguish from, the true *B. diphtheriæ*.

The above selected examples only illustrate a small part of the possible interrelationship of human and animal infectious diseases.

I am convinced we do not utilise a great deal of available information which would be most helpful to both professions by our failure to secure extended co-operation between the medical and the veterinary professions. We live and work far too much in watertight compartments.

Medical men are liable to draw hasty conclusions as to diseases in animals and their association with human diseases, which may be very incorrect, because they are imperfectly acquainted with the diseases of animals and the bacteriology of healthy animals.

The veterinary profession fail to utilise as much as they might the detailed investigations of medical men upon human diseases, which would often throw light upon animal diseases, while I have the impression that they do not sufficiently consider animal diseases from the point of view of their possible relationship to human diseases.

Certainly, it is undeniable that if both combined together more than they do we should materially improve our knowledge of the relationship between human and animal diseases.

The Incidence of Fatal Rheumatic Heart Disease in Bristol, 1876-1913.

By Major CAREY COOMBS, M.B., F.R.C.P. (Bristol).

(ABSTRACT.)

A COMPARISON between 1790 and 1920 shows that whereas at the former date carditis was beginning to be known as a complication of acute rheumatism, at the latter date we are learning to look on carditis as the disease and polyarthritis as the complication. It is a specific infection, due to micrococcus rheumaticus. Not much is certainly known as to predisposing causes. The present research was undertaken to discover what conditions dispose the patient to develop rheumatic heart disease, and to find out what total mortality it causes. A survey of mortality records was decided upon, because other data were not available. The results of these inquiries, illustrated by a map and charts, it has not yet been possible to reproduce for publication.

Though certain data emerge from this enquiry these are far from conclusive. Reasons will be given for regarding this as due in part to its basis on mortality records. Plans for research into the same problem, but on a wider basis, will be suggested.

The research was carried out under a grant from the Research Committee of the University of Bristol Colston Society.

CONGRESS AT BIRMINGHAM.

CONFERENCE III.—ENGINEERS AND SURVEYORS TO COUNTY AND OTHER SANITARY AUTHORITIES.

Presidential Address, by Sir HENRY P. MAYBURY, K.C.M.G., C.B., Director-General of Roads, Ministry of Transport.

THE circumstances in which we meet are, I think you will all agree, encouraging, hopeful and stimulating. The importance of Sanitary Science, in the promotion of which the Royal Sanitary Institute has played no small part, was never more widely recognised than in this year of grace, and I doubt whether the Sanitary Engineer ever obtained so ready and deferential a hearing as during the past War, when camp-life superseded home-life for such a large proportion of the nation.

It is to the Sanitary Engineer that we owe the immunity from disease which was the general characteristic of camp-life, and I believe the control exercised in those camps will have an abiding and salutary influence on many thousands of men who there learned by direct observation to appreciate the advantages of sanitation.

If the Sanitary Engineer in general has come into his own, I think that those engaged in one particular branch of professional work may this year claim special reasons for mutual congratulation. Municipal and County Engineers are indeed well represented in high places to-day. With Mr. John Brodie, of Liverpool, presiding over the Institution of Civil Engineers. and Mr. John Willmot, of Warwickshire, in the President's chair of the Surveyors' Institution, we must admit that full recognition has been given to the outstanding importance of our calling; a recognition, too, that we prize all the more highly as coming from fellow-workers in other related fields of activity.

Such an exceptional honour paid to the Public Health Service falls with especial fitness in this year 1920, when the thoughts of the English speaking world turn to that ardent reformer, Charles Dickens, who died exactly half-a-century ago in his beloved County of Kent, which is endeared to me by the pleasantest associations. But for the deep and vivid impression made by his works on the public conscience, it may be doubted whether the nation would have found the energy to grapple as effectively as it has

with the countless social problems which have called for solution during the past 50 years.

True, the pace has not always been headlong, and we have far to travel yet, but looking at our great towns of to-day and their administration we can observe how different a spirit prevails from that portrayed by the great novelist, and how marked an advance has been made in the material conditions of civic life, largely owing to his glowing and militant genius. Traversing our towns of to-day, Dickens would be gladdened by seeing how much has been done towards the healing of the sores which he laid bare, the loathsome riverside rookeries in which Bill Sykes found his last refuge, the crumbling, decaying horrors of Tom-all-alones where Jo herded with swarms of other homeless outcasts, the smoky drabness of Mr. Gradgrind's Coketown which stood in such dire need of the town-planner's efforts.

Let us not forget, too, what we owe to one of Dickens' contemporaries who roused England to a sense of the national shortcomings by the pictures he drew in "Alton Locke" of the pestilential hovels that disgraced parts of our country. With his deep love and reverence for the beauty of English brooks and rivers, how keenly would he have prized the efforts so successfully made by the modern sanitary engineer to ensure the purity of water-supplies and to mitigate by skilful sewage-treatment the pollution of water-courses. In few branches of our profession have more valuable results been achieved.

On such an occasion as this we may well cast back a grateful glance at pioneers like Charles Dickens and Charles Kingsley, whose fiery zeal first blazed the trail which we are endeavouring to follow. The mention, too, of these names may, perhaps, suggest to those with literary gifts the incalculable power of the pen, and the immeasurable field of public service open to those who can combine expert knowledge with the faculty of presenting that knowledge to the public in an appealing, compelling form. To create and maintain public interest in the great projects for civic improvement is one of the most essential tasks, and we are fortunate in holding this Congress in a town which fosters an enlightened public spirit, enabling schemes of the greatest magnitude to be successfully undertaken. In this district we are confronted with inspiring examples of vigorous initiative which may well put some of our less enterprising towns to shame. In the sphere of town-planning this area bids fair to provide classic examples and precedents for the emulation of other public bodies. Glancing a short time ago at a map of the Birmingham District, I noticed that the tract of country already earmarked for town-planning measured no less than 18 miles across, from North Bromsgrove in the South-West to Sutton Coldfield in the North-East. Think

of the scope thus provided for the preservation of the natural beauties of the countryside, the provision for the future needs of a growing population, the best utilisation of every local advantage in the public interest. Surely the present day is not lacking in noble opportunities.

To anyone who harbours misgivings as to the utility of town-planning, it may be a consolation to observe that only last year our French neighbours and friends, after observing proceedings in England, passed a law closely analogous to British legislation on this subject. The new law provides that every town of 10,000 population and upwards shall, within a period of three years, frame a scheme of town-planning, improvement and extension. It will be noticed that the French law is more drastic than our Act of 1919, which fixes a population limit of 20,000 as compared with the French 10,000.

Plans are to be prepared fixing the direction, width and character of the roads to be constructed or altered, and determining the sites, extent and lay-out of squares, places, public gardens, playing-grounds, parks, open spaces, monuments, buildings and public offices. Sanitary, archæological and aesthetic considerations are to be taken into account. In every Department a Commission is to be set up for the assistance of the Town Councils in the preparation of their schemes, while at the Ministry of the Interior a yet higher Commission is established to formulate general principles for the guidance of the subordinate Authorities.

Clearly, in the eyes of our talented cross-channel friends, town-planning has proved its case and justified its aims. Looking further afield, doubters can gain assurance by the example of New York, which put into force four years ago a remarkable measure for the control of the development of their City; the so-called " building zone plan " In this connection, a few phrases may usefully be quoted from the Commission's report: " City planning is a prime need of our city. It is plain commonsense to have a plan before starting to build. City building is no exception to the rule. Haphazard city building without a comprehensive plan is ruinous. The bigger a city grows, the more essential a plan becomes. Traffic problems, the congestion of population, the intensive use of land, the magnitude of the property values involved, make the control of building development more and more essential to the health, comfort and welfare of the city and its inhabitants. New York City has reached a point beyond which continued unplanned growth cannot take place without inviting social and economic disaster." Phrases which may be applied far beyond the boundaries of New York or the United States.

Hence the setting apart by this scheme of distinctive zones: residential districts protected against the invasion of trade and industry, so as to safeguard the health and nerves of the worker seeking quiet in his home; business

districts which may not be over-run by trades and industries that are admittedly a nuisance in an area devoted to retail business ; warehouse districts adjoining the water-front and rail terminals, and so on ; suitable restrictions being imposed in each zone regarding open spaces, yards, height of buildings, etc. The lofty conception of civic responsibility which pervades this measure is worthy of our admiration, and the scheme will repay close study.

It is my hope that all engaged in town-planning will realise how intimately connected are the problems of housing and transit on the one hand, and congestion and transport on the other, a fact that has been brought home with ever increasing force to those who, like myself, have been sitting on the Advisory Committee on London Traffic, set up by the Minister of Transport under the chairmanship of Mr. Kennedy Jones, M.P.

The following remarkable figures submitted to that Committee by the staff of the London County Council illustrate the immense strain imposed on London's transit-agencies by the growing population of the Metropolis and by the increasing use which that population makes of travelling facilities.

	Numbers of Passengers (Millions).				Journeys per head.
	1905.	1914.	1918.	1919.	1919
*Tube Railways ...	69	147	254	266	36
District Railways ...	56	85	133	140	54
Other Local Railways	180	172	223	253	
Total Local Railways	305	404	610	659	
Tramways	478	844	992	1,053	143
Omnibuses	291	757	682	861	117
Total	1,074	2,005	2,284	2,573	350
Population	6,857,694	7,419,704	6,784,480	7,356,653	—
Journeys per head ...	157	270	337	350	—

* Tubes, District and other Local Railways include :—

Central London.
City & South London.
London Electric.
Waterloo and City.
Metropolitan District and Extensions.
Whitechapel and Bow.
Great Northern and City.
East London.
North and South West Junction.
North London.

" Suburban traffic on main lines " represents the bookings within a radius of 30 miles on lines not specified above.

The figures for suburban traffic on main lines are very problematical, but it has been estimated on good authority that there were, approximately, 468 million passengers for the year 1919. This increases the number of journeys per head to 413.

These statistics shew what an alarming growth in the travel-habit we have to reckon with, the number of journeys per head of population having risen apparently from 157 per annum in 1905 to 413 in 1919,—not far short of a three-fold increase.*

The health of the community demands, not only that the city worker shall be adequately housed in a cheerful environment, but that he shall travel to and from his work with the minimum of discomfort and wasted time. The perilous congestion of our great towns to-day forbids us to neglect any means of transit, and speaking in the presence of highway engineers there is no need for me to labour the amazing development of road traffic which has marked recent years. Not only is the traffic increasing in quantity, but it is profoundly modified in character, and our standards of road construction must be drastically amended and adapted to conform to these changed demands. It is with sincere pleasure that I recognise the brilliant part played by Birmingham and Liverpool in the design of new thoroughfares with dimensions proportioned to modern traffic needs.

The influence of such roads on public health is not to be lightly estimated ; as ventilating ducts, as conduits for breeze and sunshine, as an opportunity of recreation and pleasure (for road-travel is one of the favourite popular relaxations), as a means for the rapid distribution of perishable articles of food: in all these various modes the great highways of the future will serve as invaluable instruments of hygiene.

On these grounds alone, much might be urged in favour of the recognition of some national responsibility for arterial thoroughfares, but when to these considerations is added the incalculable importance of road borne traffic to British commerce at large, the arguments become unanswerable.

Experience gained, too, during the Great War taught all those responsible for communications the immense significance of highways and the supreme life-and-death importance that may attach to them in times of national emergencies.

Small wonder, then, that the decision has now been reached to proceed with the classification of roads, so as to divide them into categories according to the importance of the centres they connect, and to the character of the traffic they bear, whether short distance for local benefit, or long-distance for the good of commerce in a wider sense.

* These figures are not strictly comparable as the 1905 figure does not include suburban traffic on main lines, which forms, however, part of the total of 413 quoted for the year 1919.

The national contribution now contemplated towards the expenditure of Highway Authorities engaged in the upkeep of roads of national concern will bring about a levelling-up process, and enable a general standard of efficiency to be maintained throughout the country, a standard which the comparative poverty of some areas has rendered impossible of attainment in the past. Concurrently the new scheme will, I hope and believe, have the effect of raising the status of the Highway Engineer by placing his appointment on a more secure footing, in virtue of the grant to be made from national funds towards his salary. Few would question the right of the Municipal and County Engineer to every reasonable privilege and facility for the rendering of so wide a range of service to the community. His task is rendered all the more arduous by the unavoidable arrears of work which have accumulated since 1914, and by the difficulties which attend the execution of any enterprise to-day (uncertain and rising costs of material and labour, and the loss of those countless precedents and traditions to which an appeal could so easily be made before the war) but not in 1920, after the great storm which has swept away so many landmarks.

To keep abreast of the times is no light strain. There is hardly a science to which you can safely plead indifference; hence the value of occasions such as the present, when we meet as friends and colleagues to establish a kind of clearing-house for information, and to profit by the experience laid before us in the papers illustrating the problems of modern practice?

What the range of those problems is, who can describe? The whole circle of existence is your province; from the planting of infants' playgrounds to the laying out of the cemetery; from the provision of an uncontaminated water supply at one end to the purification of sewage at the other; from the trapping of rats to the search for catchment areas.

There should be topics of conversation and to spare between men engaged in such a dazzling variety of occupations, and I am happy to yield place to those who are in a position to give us what we might describe as a "refresher" course in divers branches of engineering work.

The Hygiene of Road Pavements.

By Ernest Worrall, F.S.I., Surveyor, Stretford U.D.C.

THE sanitary qualities of various pavements have been described in many papers dealing primarily with other features of road construction, but the writer is unaware of any paper relating chiefly to the hygiene of the subject, hence its selection, and also as being appropriate to a conference under the wing of the Royal Sanitary Institute.

The incidence of pavements on public health has long been recognised. In 1848, the then Borough Engineer of Liverpool reported to the Health Committee of that town :—

> "If the streets of a town be unevenly paved, putrid exhalations will constantly arise from the accumulations of filth in the hollows and joints of the stones, which neither the scavenger's brush nor water can remove."
>
> "A smooth non-absorbent surface, from which the dirt is easily removed, without hollows or open joints to collect the filth, is what health demands, when it possesses in addition the quality of hardness, and such a surface offers the least resistance to traction. Tested by this a macadamized street is the worst that possibly can be made. In such a street the soft absorbent material becomes soaked with liquid filth, which, putrefying, sends its noxious exhalations into the atmosphere. Where there is great traffic the road wears so fast as to be constantly under repair, while by every indentation of the surface and the laying on of loose materials, the friction is immensely increased. In wet weather it is covered with mud, and in dry weather the air is loaded with the dust of the disintegrated stones, mingled with the filth caused by the traffic, producing disease of the respiratory organs, and rapidly deteriorating food and clothing in the houses, and the articles exposed for sale in the neighbouring shops. If to these evils it is added that a macadam road is the most expensive to keep in repair, and costs four times as much to cleanse as a paved road, I shall be borne out in saying that such a road in a town is an expensive nuisance, which should be done away with as soon as possible."

FIG. 1.

FIGURE 1.—WATER-BOUND MACADAM PAVEMENT.

That pronouncement is as true to-day as when it was made. The view shewn in Fig. 1 is of a macadam pavement in a good residential road abraded by a moderately heavy traffic.

The importance of the subject is obviously due in largest measure to the advent and growth of fast and heavy motor traffic in the past 14-15 years. Events in this period have so crowded one's experience that many will have almost forgotten the outburst of indignation and complaint that followed the dust-laden atmosphere in the earlier days of motoring. And the outcry was fully warranted. We seldom now see such clouds of dust as then followed in the wake of motor traffic.

In investigations at the time the dust was proved to be argillaceous and calcareous and the medical view was expressed that if it became lodged in the lung tissue it would predispose to phthisis.

The first palliative was a more frequent recourse in urban areas to water spraying, which was as non-durable as it was expensive. Its very temporary binding effect on granular surfaces, besides its temporary cooling effect in sultry weather, was perhaps its only other utility.

TARRED PAVEMENTS.

Next came coal tar, and its use as an agent in road work may be said to mark an epoch in our subject. Like many other innovations its first use cannot be traced, the idea seeming to have originated and experiments been made in several districts simultaneously. Its use at first, nearly 40 years ago, appears to have been on gravel or cinder paths or footways.

Twenty years ago such was done on an extensive scale. The local authority owned the gas works, the by-product was a drug on the market, and it is probable that its disposal in that manner was as agreeable to the gas undertaking as it was advantageous to the roads department.

Its first use on paths thus shows it to have been as a surface binder rather than a preventative of dust, this latter property appearing later. The viscous property of tar was initially the one feature that prompted its use on roads, and no attention was paid to its variable quality for the purpose. By a slow process of trial and error aided by the analytical chemist, the ammoniacal liquor and lighter volatile oils, naphthalin and phenol have come to be distilled before tar intended either for spraying or as a binder or matrix, is or should be sold for use in road work. This has had the effect of standardising such tar and it may be roughly tested in terms of weight at 12 lbs. per gallon at 60° F. *i.e.*, 20 per cent. heavier than water at the same temperature.

The British Engineering Standards' Committee has adopted the Road Board's specification of a comprehensive character for tar ; it may be obtained for a few pence of the Secretary at 28, Victoria Street, S.W. 1.

The claim has recently been made that crude tar shews equally good results to prepared tar in road-spraying work. It may be an instance of reasoning from the particular to the general ; it certainly does not accord with the common experience of road engineers and surveyors.

A necessary condition of the road and material used is the absence of moisture, thus tar can be successfully applied only during a spell of dry weather.

Chloride of calcium and similar deliquescent agents dissolved in water and spread from water carts, besides a host of proprietary mixtures, have also been used as palliatives for the dust nuisance. The writer has tried a goodly share of them with varying result but with invariable disappointment.

Tar painting or spraying is not thus referred to as a pavement, but rather as a means which has been employed with a large measure of success for temporarily water-proofing and fixing the loose surfaces of pavements which exceed in area all other types combined.

Tar as a matrix for macadam and similar pavements has served its purpose in the evolution of road making. It is, however, far from being played out. Its relative cheapness and availability and its production largely by the authorities concerned also with road-work will ensure it a long continuance.

Sett Pavements.

Stone and granite setts of differing origin and quality comprise a large portion of the road and street pavements, more especially in the North

and North-midland towns. In Lancashire and Yorkshire the native sandstone variety is in common use when a more durable pavement than macadam is desired. They are noisy and absorbent and when laid "dry," that is without an asphaltic joint, their absorption is almost as bad as a macadam surface. Their gravel or pitched foundation adds further to that demerit. They are broadly of two kinds of rock, freestone, *i.e.*, granular without lines of cleavage, and flagstone of more or less regular lamination. There is little to choose between them from a sanitary point of view. Besides the porosity of the material itself, these setts having a surface area of from 24 to 48 ins. or more, and joints from ·5 to ·75 inches wide, the latter are equal to near 20 per cent. of the whole area so paved. The objectionable feature is minimised when a durable water-tight jointing material is used. In neither case is it possible to adopt an unyielding bed such as concrete for heavy traffic, as the relatively soft stone will not withstand the impact of iron shod vehicles and hoofs.

Within the writer's experience a very heavy traffic road paved with Lancashire setts by the estate owner had fallen into a condition that called for satisfactory completion and adoption. The Authority's notice specified reconstruction with granite setts on concrete, and, the estate owner objecting, the question was referred by agreement to arbitration. The Board of Trade appointed an eminent Mechanical Engineer to arbitrate, and he compromised the difference by awarding that the existing soft setts should be relaid on a foundation of Portland cement concrete! The Local Authority saved the situation by substituting granite setts with asphaltic joints and paying the difference in cost. This was 12 years ago, and the pavement is still excellent and sanitary and has not had or needed any repair although carrying much of the heaviest industrial traffic of Lancashire.

WOOD PAVEMENTS.

The earlier objections to wood blocks for street paving have been overcome by the methods now adopted of impregnating the material with heated creosote in vacuo. This has the effect of filling the pores, which would otherwise absorb and exhale filth, with a preservative and anti-toxic, and very considerable success has attended the method.

The area and importance of the thoroughfares in London alone that have been so paved, the enormous traffic they carry and the effective life of the pavement is striking testimony to the all-round efficiency of pine-block road surfaces. A strong unyielding foundation of concrete, in itself a sanitary provision, is a necessary adjunct, and the combination gives a pavement second only from the hygienic position to natural asphalte.

Asphalt Pavements.

The growing use of natural or rock asphalt with varying mixtures is unmistakably significant and may be said to mark another period in the development of hygienic pavements. Its sanitary properties are almost identical with those attributed to tar, but it is infinitely more stable and durable and therefore more likely to come into permanent use.

So many mixtures containing asphalt in varying degree and quality are on the market that the generic term has come to be rather loosely used and understood. A sectional committee of the British Engineering Standards Committee defined *native or rock asphalt* as: "a rock which has been impregnated by nature with bitumen," and *native bitumen* as: "bitumen found in nature carrying in suspension a variable proportion of mineral matter." That is not very illuminating; but the report sensibly commends that, for convenience of identification, prefixes denoting geographically the source of origin should be attached to the term. A feature common to all bitumens or hydrocarbon products is that they are soluble in carbon disulphide ($C.S_2$). The writer is best acquainted by visits and experience with the deposits at Limmer, in Hanover, and Vorwhole, in Brunswick, and believes them to yield the best imported asphalts for road work. Their supply has obviously been interrupted during the past five years, but with the resumption of trading relations and conditions we may expect soon to see the material again on a commercial scale.

He prefers the material for the same reason that he would select natural rather than artificially compounded cement, man being unable in a few days to do by mechanical admixture what nature has taken ages to effect in the combination of essential ingredients in the one or the other. There are similar deposits to those above named at Neuchatel, Lucerne, Seyssel, Levagwy, Haute Tarvie and Val de Travers.

It is difficult, if not impossible, to determine the effect on the public health and the mortality rates of such pavements as compared with, say, macadam and setts which were formerly in more common use and are still so in the neighbouring districts. The improvement coincides with other sanitary measures—improved sewerage and drainage, scavenging, schools, nursing, clinics and the other assets of modern communal life under a progressive authority, and the credit can only be balanced in common therewith.

A typical view of a rock asphalt pavement is shewn in Fig. 2. Its condition and quality *in situ* is in every way as good as the plate indicates. It shows no sign of deterioration, and for any evidence to the contrary it should last as long as the property alongside it. From a sanitary view-point nothing better can be imagined; and it is a vivid contrast to the road surface shewn in Fig. 1.

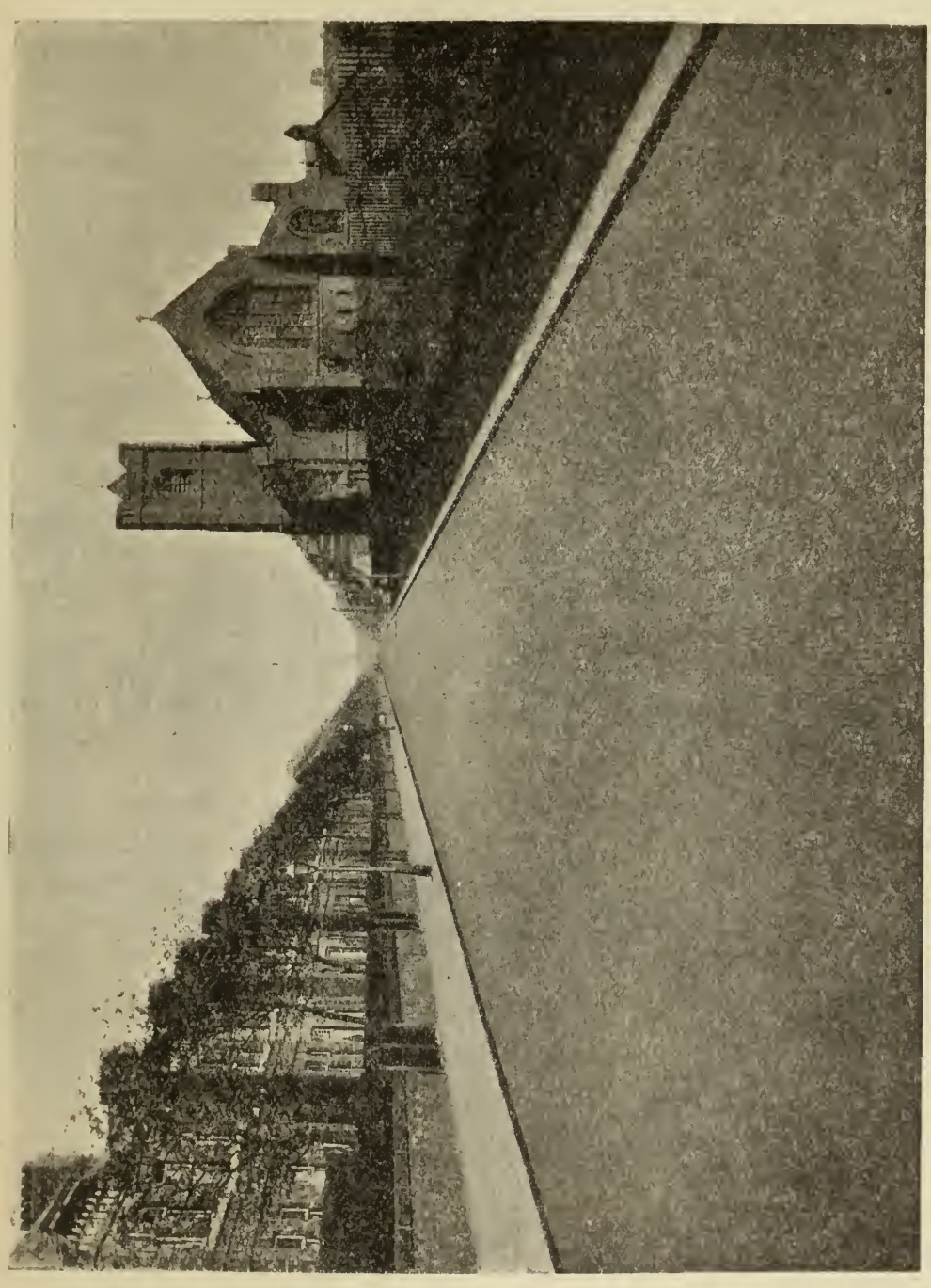


FIG. 2.
A TYPICAL VIEW OF ROCK ASPHALT PAVEMENT.

Asphaltic Macadam.

Asphaltic macadam, a cheaper form of construction than rock asphalt, may be placed next in order for its hygienic qualities. There are large and reliable firms, specialising in the work and taking their names or their methods chiefly from the geographical source of origin of the matrix they use. Provided they exclude pitch and tar compounds there is little to choose between their several processes, which indeed are essentially alike. They aim at compactness of section and complete filling of the interstices, given which, of sufficient depth and falls and a sealed surface of suitable contour, they achieve a completely sanitary road—comparatively clean, dustless and quiet, easy to scavenge and traverse and reasonably durable.

Concrete Pavements.

Cement concrete as a material for surfacing road pavements has been in use on paths and crossings 50 years or more, the *granolithic* form being much in evidence in the seventies, but as a surface for carriageways it is the newest recruit of the road engineer in this country. In America some 2,000 miles of such roads are said to have been completed and to give general satisfaction. Their hygienic properties depend upon their degree of porosity, and abrasion into dust. The latter is mitigated by tar-painting or spraying and the former is a question of the proportion and quality of the cement used, the element of care in the selection and use of the materials as in many other pavements counting for much.

Foundations.

While the surface condition and qualities of a road pavement would appear to be of the greater importance from a sanitary standpoint than the quality and kind of bed or foundation upon which it is laid, it is only so within limits. Indeed these are in reality interdependent.

Notwithstanding all the reconstruction of roads in recent years, the great bulk of the arterial lines were and remain layer upon layer of gravel or broken stone, consolidated more or less according to the nature of the under-bed or subsoil by traffic or roller.

The length of roads and streets in England and Wales is near 150,000 miles and probably 70 per cent. of this is of gravel or macadam or similar material without other foundation. Its reconstruction if done at the big rate of 1,300 miles a year would thus occupy the remainder of the present century. The immensity of the problem of reconstruction from financial and practical considerations is fairly obvious and form interesting matter for calculation and speculation, but they are outside the scope of the paper.

ROAD DRAINAGE.

It is a *sine qua non* in road construction that for stability and durability the road bed must be dry and if wet it must be drained. Such drainage when efficient like all good drainage is an important sanitary agent. The greater immobility and compactness of a dry bed and foundation reduces surface and interstitial movement in the road material thus enabling a firmer and less yielding crust to be obtained. This in turn when of suitable convexity to the level or inclination of the road admits of free surface drainage. Excessive convexity like insufficient width tends to attract traffic to the centre or crest in single file, forming grooves by constant use on a narrow line breaking the road crust and holding up or conducting water in ruts and destroying the lateral drainage sought by the convex formation.

The narrow paved streets of Pompeii, sufficient in width between the curbs for only one wheeled vehicle are grooved to a depth of quite 6 ins. near the sides. But for their gradient they would have made that historic capital with its closely packed houses and population an unhealthy though a wealthy city, as wealth was counted in those far off days.

Assuming the water to have been drained to the road sides its removal thence depends upon the facilities available. In country places the adjoining land or water course is utilised in various ways. In towns and populous places where a sewerage or drainage system is provided its position in the roads or streets makes their effective drainage a relatively simple matter.

Trapped surface gullies in the channels of the carriageway spaced at greater or lesser intervals as the flatness or gradient and width of the road require are in this country the invariable device for the purpose and they serve it probably as well as any other known method. The shape and size of such gullies are, however, worth more attention than they get. Standard sizes and patterns have for commercial reasons become stereotyped and they are used rather as the readiest means available than for their suitability to any particular case. They are mostly too large, permitting bigger accumulation of foulness in the midst of the people and for a longer period than any other appliance in common use. They are so made to accommodate infrequent cleansing.

With the growth in every direction of sanitary knowledge and practice, and demands on the authorities to improve their public services the time may be anticipated when the cleansing and re-charging of street gullies will be done as frequently as the sweeping and scavenging of the pavements. They would thereby none the less serve their threefold purpose of drainage, and the interception of sewer gases and of detritus from the sewers. Excep-

tions to that rule are in the vicinity of industries where hot or chemical wastes pass into the sewers and by expansion create a greater than atmospheric internal pressure thus forcing the shallow water seal of small gullies. The writer illustrated such conditions to a Commons Committee last session, and his Council obtained thereby additional powers prohibiting in their district the admission of such effluents to sewers and making their admission *per se* a nuisance without further proof (Section 103 Stretford Urban District Council Act, 1919), as follows:—

> " (1) From and after the passing of this Act it shall not be lawful for any person to tap or blow off any steam boiler in connection with any premises where any trade or manufacture is carried on at a greater pressure than twenty pounds or to discharge the water from any dye-pan or other receptacle into any sewer of the Council unless the water in such boiler or dye-pan or receptacle shall have been so cooled as effectually to prevent any steam from such water being emitted in any street manhole, gully, or other drain opening in connection with such sewer.
>
> " (2) Any person who shall offend against the provisions of this section shall be liable to a penalty not exceeding ten pounds and to a daily penalty not exceeding twenty shillings."

Road Scavenging.

Efficient road scavenging in relation to the hygiene of pavements is of scarcely less importance than good construction, indeed, inferior pavements are more tolerable if systematic and regular attention is paid to their cleansing. The report quoted in the opening page of this paper laid stress on the advantages of a pavement that could be washed, and doubtless that is the ideal to which road authorities may aspire.

Primitive methods of scavenging are still extant. Since the besom gave way to the broom, both wielded by hand, and this in turn to the horse-drawn rotary sweeper very little real progress has been made in the operation of road cleansing. The problem is not easy of solution. The machines for at once sweeping and collectng the miscellaneous waste that goes to make up road garbage which appear and re-appear in somewhat different form from time to time and are claimed by their inventors or makers to accomplish that purpose are really efficient only under favourable weather conditions and they as yet seldom progress beyond the demonstration stage. Those conditions are as variable as the weather itself and herein lies the difficulties of the problem.

The needed frequency and the cost of road sweeping is greatly affected by the character and quality of the road pavement. Macadam was stated

by the author previously quoted to cost four times as much to cleanse as a paved road, meaning thereby one paved with setts, which in turn may be said to greatly exceed the cost on a jointless pavement.

This is a factor that is apt to be overlooked when determining the type of pavement for newly paved or repaved roads, the cost of scavenging and other upkeep being regarded as separate and distinct whereas they are really one and the same question in capitalising road maintenance expenses. It may seem rather apart from the subject, but after all cost is the controlling or chief factor, and the more favourably the hygienic pavement can be shewn to compare in cost with other types, the greater probability of its adoption and the resulting sanitary benefits.

Estimates of cost at the present time with basic rates moving almost monthly are necessarily indefinite, but a comparison will perhaps make the point clear. It is the writer's practice to do scavenging on his asphalt pavements solely by men with orderly carts. One man with cart is responsible for a group of streets that would otherwise entail the services of two men with horse and cart plus the sweeper twice a week. The cost is thus as ·6 to 1 or a saving of 40 per cent—allowing the horse to cost twice the labour of a man.

FOOTPATHS.

The footpaths or causeways of a street in the vicinity of dwellings average a third of its whole area and while they carry nothing like the weight they accommodate probably as large a volume of traffic as the carriageway. The material and manner of their paving is thus of importance on sanitary grounds.

Granolithic or cement-concrete laid *in-situ* has previously been mentioned as a pavement for paths many years ago but this is seldom laid now. The irregular cracks invariably showing in it marred its appearance, and deterioration once commenced was rapid. Its sanitary condition when new and sound was doubtless good, but when friable through decay such pavements become little better than gravel.

They have given way to concrete flags of which the makes and makers are legion. Laid with close square joints on an even bed they give an excellent surface but they snap readily on an unequal bed or from the impact of blows such as the tipping of coal and the like from carts.

Tarred chippings rolled to consolidation and sprinkled with limestone, commonly miscalled asphalt, is one of the commonest forms of pavement for paths and if maintained in fair condition it serves its purpose reasonably well.

Staffordshire tiles have been largely used in and near that county for paving paths. Their numerous joints and unevenness of surface render them not quite a sanitary method and they are certainly not pleasing in appearance.

Natural stone flags of various laminated rock, sandstone, limestone, slate, etc., form probably the largest area of well-constructed street paths. They wear unevenly, and, while newly laid they may have close joints, the masons' ineradicable habit of spalling rather than square-dressing the edges causing them to wear down with gaping joints that greatly mar the otherwise hygienic qualities of the pavement.

Natural rock asphalt as a paving material for paths has the same properties as when used in the carriageway and these have been mentioned at length. It is laid of smaller section, the writer's practice being to use 1 in. of the asphalt surfacing on 3 ins. of cement concrete.

The Evolution of the Road.

By J. W. Willis Bund, C.B.E., Chairman, Worcestershire County Council.

(Abstract.)

THE history of the road from the time it was a mere track through swamps and over hills, to the present day, when it is a highly finished artificial product, costing over £5,000 a mile to reconstruct, is one of great importance and interest. All the different stages can be clearly traced, and each of them marks a distinct step in our civilization. Originally roads were merely paths, followed by the native tribesmen and their cattle, later such vehicular traffic as there might chance to be passed over these paths, as and when they could, which was far from being always. It was not until the Romans settled in Britain that regular roads were made and on a definite system. From them we get the first glimpse of a classification of routes in their division of roads into two great groups, " ways " and " streets," the first " the way " being, as a rule, unpaved, the second, " the street," a paved road. The " Foss way," a cross-country road, represents the first-class, the " Watling Street," the great Roman road from London to Chester, the second. Then, as now, London was the centre of administration, and from London such groups of roads as were necessary radiated to the various parts of the country. The first group went South-East to Canterbury and the Kentish ports. The second group went West to Silchester, from whence branches went off to Winchester, Exeter, Bath, Gloucester and South Wales. The third group, the " Watling Street " and its branches, went to St. Albans, Lichfield, Uriconium and Chester, the fourth went to Colchester and the Eastern Counties, continuing on to Lincoln and York, the fifth, the Foss Way, a cross-country group, from Lincoln South-West to Leicester, Cirencester, Bath and Exeter. These roads and their branches were sufficient for the purpose of the Romans, which were in the main what we should now term " Through Traffic," the movement of troops and the movement of produce for export to Rome. It is important to keep these routes in mind, as, in spite of all the changes for nearly two thousand years, these roads are still either the main lines of communication in the country, or the basis upon which the modern system of roads has been built up.

It is not clear how the Romans kept these roads in repair, or who was liable for the repair of them ; in all probability the repairs were made by forced native labour, carried out under Roman superintendence.

When the Romans withdrew from Britain and the Saxon settlement ensued, a most important change came about in road management, which may

best be described by saying that the traffic ceased to be through and became local. The Saxon kings had little interest in districts outside their own sphere of influence, except with the idea of extending this, and so each of the Saxon Kings, if they did any road making, which is doubtful, beyond taking possession of such parts of the Roman roads as were in their own Kingdom, were content to confine their activities to these parts. They, however, introduced a system which has had a most far reaching effect on road repair and maintenance. All Saxon landowners of private land (Bocland) held it subject to certain services to the State, one of which was the repair of the Highways and Bridges. Thus, placing on the landowner the duty of maintaining the roads, whether it was the roads adjoining his land, or, as it became later, the roads in his parish, this became the basis of English Highway Law, and marks the point of the liability of the local landowner to keep the roads fit for the maintenance of local traffic.

It is said that the earliest mention we find of this liability is in a Charter of Offa. Some writers put it much earlier, but taking the date to be in Offa's reign (he died in 796) the system has prevailed for at least twelve hundred years. No very great change subsequently took place. The traffic on the roads was little and was mostly a summer and fine weather traffic. It arose from three great sources, markets, fairs and pilgrimages. The local markets were probably small, as each person consumed his own produce, but the fairs and the pilgrimages revived the idea of through traffic.

Mainly on the East coast traders came from Normandy and the Low Countries, bringing goods to be disposed of at local fairs. The great religious houses that were scattered over the land each obtained from the Crown, or from their feudal Lord, the right to hold a fair. Such fair attracted merchants from abroad, and to some extent revived traffic. It was often the case that it was unsafe to travel alone, as thieves abounded and highway robberies were frequent. To check this the celebrated Statute of Winchester was passed, in 1285. It placed on the County the liability for making good to the person robbed the loss he had sustained. To prevent robberies it provided that highways leading from one market town to another should be so enlarged that there should not be any "dike, tree, or bush wherein a man might lurk to do hurt within 200 feet on one side and 200 feet on the other side of the road, but it was not to extend to great Oaks or other trees, so that it be clear underneath."

If the landowner did not clear away the bushes he was to be liable to answer for any robbery.

This Statute began the classification of roads in our sense of the term. All roads leading from one market town to another were to be clear for 200 feet on each side, other roads might be narrow and overgrown with bushes.

The great Abbeys took advantage of the improvement of access in two ways. Those which had not already got the right from the King to hold a market at once endeavoured to obtain such right, and as the market tolls were heavy, the right to hold a market soon became a much sought for privilege. In addition to this most of the Abbeys had some shrine to which pilgrimages could be made, and so were in the happy state that they attracted travellers both from the temporal and the spiritual side. The merchant who came to the market town by the aid of the Saint could dispose of his merchandise at a good price and could also gain spiritual benefit by making his offerings at the Shrine of the Saint of the Abbey. Traces of the practice linger in the name of the "Pilgrims' Way," which still clings to some of the roads that led to the market towns where there are shrines of Saints, and in the fact recorded in many of the ancient Charters in Cathedral Cities, that either the Mayor and Corporation, or the Dean and Chapter, have a right to hold a fair and retain the profits of the market.

In some places further efforts were made to increase income by increasing traffic. If a town was situated on a river, either the Abbey or the Lord of the town would get, or try to get from the Crown, the right to build a bridge over the river and to charge toll for its use. This right of charging tolls became an important one, gave rise to considerable disputes between the Lord of the Town and the Abbot. The erection of a bridge helped to develop traffic.

Until the end of the Wars of the Roses the traffic on the roads continued to be conducted much on the lines indicated, but on the conclusion of the Wars the importance of the local trade largely increased. The roads seem to have been made more use of and the idea gained ground that it was good for trade that the markets should have access to them made as easy as possible. There is, however, one point that should be carefully borne in mind, that is, most of the traffic hitherto spoken of, especially the through traffic, was done either by the travellers themselves riding and taking their goods on pack horses, or by traders walking or riding with a long train of pack horses. Except local carts for agriculture there seems to have been but little wheeled traffic on the roads before the accession of Elizabeth, while carriages, as a means of conveyance, did not become usual, much, if at all, before the Civil War. Therefore, if the roads were bad, and they were probably very bad, for they were not constructed. After making every allowance, the roads must, in the 17th Century, have been in a dreadful state. It was part of the duty of the Constables in each parish, if the roads needed repair, to make a presentment to Quarter Sessions so that the Parish might be ordered by the Court.

to put the road into repair, and if it failed to do so the Parish was fined. In Worcestershire, in 1635, there were a number of presentments to Quarter Sessions as to the bad state of repair of the Highways in the different Parishes. Some of the roads that were out of repair are not merely country roads, but main trunk roads, for instance, the road leading from Worcester to Pershore.

Numberless instances might be given of the state the roads of the country had fallen into, and the necessity imposed on Parliament for taking some vigorous steps to improve the roads. This was done by going back to the old Roman idea that through roads carrying through traffic should be made a national charge, and only local roads dealing with local traffic should be left to be locally repaired. Great help towards carrying out this idea was given by John Ogilby (1600-1676), he divided up all the principal roads of England and Wales into four classes :—

(1) Independent and dependent direct roads.

(2) Principal and accidental cross roads.

The first class contained fourteen roads.

The second class, the " Dependent direct routes," Ogilby defines as such roads " as at several distances branch out of the former independent roads." He makes seventeen of these.

Cross roads, the third class, consist of " those independent cross roads which start from some point on one of the principal roads and go direct to a point on another main road." Of these Ogilby makes thirty-one.

The fourth class are " all accidental cross roads, that is, such roads as are not in a direct line, but comprise either two or three horizontal bearings." Of these there are ten.

These 58 roads appear to have been the most important roads in England and Wales. Up to the Civil War and to the middle of the 17th century the chief traffic the roads carried was horse traffic ; travellers rode and horses and mules conveyed the goods on their backs. From the end of the 17th century wheel traffic began to come in, this caused the roads to cost more in repair, and this could not in fairness be placed on the parishes. An idea gradually grew up that the fairest thing to do was to make those who used the roads pay for repairing them, and this idea led to the establishment of turnpikes. Persons who were liable to maintain a length of road joined together to repair and keep in repair such lengths, and in order to recoup themselves for the cost erected gates or barriers across the road and took tolls from the persons using the road. At first there was violent opposition to this system, Private Acts were passed giving the persons named in them powers to charge tolls provided they kept the roads in repair and authorising such persons to prevent anyone passing along the road who refused to pay the toll. In the first half of the 18th cen-

tury these Private Acts became so frequent that soon after the accession of George III. general Acts were passed, setting up a body of Trustees to keep certain of the roads in repair, and charge tolls for using the roads, the tolls going to form a fund for maintaining, repairing and improving the road.

Speaking generally, all the roads mentioned in Ogilby's list during the 18th century became turnpike roads, so that list gives a good idea of the class of roads that were kept in repair by the users of the roads. Other less important roads were maintained by the parishes through which they passed. The change made by turnpikes marks a very important point in the history of the roads. It recognises the change required by the use of wheeled conveyances instead of horse conveyance, and provides that those who made the change necessary should contribute not merely to the maintenance of the road, but also to its improvement. The Turnpike Trustees not only kept the roads in repair by means of the tolls, but also by lowering hills, straightening roads, cutting off corners, and widening roads, greatly improved the means of transport from one part of the county to another. In fact, it was the cost of the improvements that practically, in the last half of the 19th century, caused the Turnpike Trustees in most cases to be heavily in debt.

In 1862 an Act (25 and 26 Vict. c. 61) was passed that formed parishes into districts for the management and repair of district roads and created highway boards for the control of the highway districts. By the Highways and Locomotives Act, 1878, Parliament abolished all turnpikes, and handed the roads over to Quarter Sessions, empowering them to levy rates on the whole county for the maintenance and repair of the roads, supplementing the cost of the repair of the main roads by a grant out of the Exchequer, so that all the main roads were maintained by two funds, local and imperial. When County Councils were set up, the management of the main roads was transferred from Quarter Sessions to the County Councils, and the roads are still maintained by a fund derived partly from rates and partly by grants from the Imperial Exchequer.

Within the last few years a change something like the change from horse traffic to wheeled traffic has come about. Roads that were suited for animal traction are far too weak to carry mechanical traction, and, as in the 18th century, the main roads had to be changed to suit wheeled traffic, so, now in the 20th century, they will have to be changed and adapted to carry the new form of transport, a change which greatly increases the whole cost of road maintenance.

The aim of the paper has been to show the process by which the tracks over the hills or across the plains gradually became beaten paths, then how

they became adapted for horse traffic, how that developed with wheeled traffic, and how the roads had to be altered and improved to carry that traffic, and now, as a new means of traction has developed, is developing, and is likely to further develop, the necessary changes it requires must be carried out as they had to be carried out to meet the old developments.

A discussion on "Arterial Roads," was opened by C. F. Gettings, M.Inst.C.E.

The Local Surveyor.

By T. G. Fisher, Superintending Valuer, Inland Revenue, Birmingham, F.S.I. (Member).

[Abstract.]

THE Local Surveyor. Appointed under the Public Health and Local Government Acts of Parliament. Title not ideal, but only term appropriate to Section of Surveying Profession concerned. Most of the Professional Associations, including the Royal Sanitary Institute and Surveyors' Institution, have some of these officials in their ranks. Interesting to trace the evolution of Local Surveyor from "Roman Curators." Anglo-Saxon Freemen—Surveyors of Bridges (1530) "Surveyors" (1555), to Surveyor originating in the Highway Act, 1835, down to the Surveyor and Engineer of present day.

Under the Public Health and Local Government Acts, this official is responsible for Roads and Highways, Sewers, Buildings, etc., and has various other responsibilities and powers. Is closely associated with Inspector of Nuisances and Medical Officer of Health. "District Surveyor" originates under "London Building Acts," is certified by Royal Institute of British Architects. Surveyors' duties now extended to Housing and Town Planning. Duties required from Local Surveyor in some cases extend to Lighting, Sewage Works, Pumping Stations, Allotments, Pleasure Grounds, Tramways, Electricity and Parliamentary Work.

Annual expenditure of Local Authorities in 1905-6 about 111 millions. Loans then outstanding about 483 millions. Annual liability for repayment and interest, about 25 millions.

Annual expenditure of Boroughs, County Councils, U.D.C.'s, R.D.C.'s and Parish Councils in 1913-14 about 75 millions, with Loans outstanding, about 329 millions and a salary list of about 2½ millions. Loans asked

for first quarter, 1920, 147 millions, as against 40 millions for same period of 1918 and 2½ millions for 1917. All Municipalities and Authorities in arrear with work owing to war. Bulk of expenditure originates or passes through Surveyor's Department. Some small Authorities still fail to appreciate worth of Surveyor and expect efficiency for £2 10s. per week.

Surveyors' Institution and Institution of County and Municipal Engineers have forwarded to the Ministries of Health and Transport a list of suggested Salaries and Qualifications. The Institute of Civil Engineers this year proposed a Bill to practically restrict Civil Engineering to the members of their Institution. Bill withdrawn for the present.

Inspector of Nuisances and Medical Officer of Health protected by legislation. Execution of all Drainage Work should rest with Surveyor. Question whether certain duties of the M.O.H.'s under the Housing Acts might not pass to Surveyor.

Security of Tenure advocated by Public Health (Qualification and Security of Tenure) Bill, 1905 (not proceeded with). Generally agreed that Surveyor should be qualified and adequately remunerated and have reasonable security of Tenure. General Conference desirable. Is this within the range of the Institutions referred to ? Movement should be supported by all officials concerned.

The Conservation of Water Supply in England and Wales.

By Frederic W. Macaulay, M.Inst.C.E., F.R.Met.Soc.

(Abstract).

THE Paper deals with the conservation of water supply from the following points of view :—

(*a*) The fullest and most economic utilisation of all water sources—on the surface or underground—for all the purposes for which water can be used and the prevention from pollution or misuse of all such sources.

(*b*) The apportionment and distribution of the water from all sources fairly and equally, having due regard to precedence amongst all classes of water users in the national interests.

(*c*) The prevention of waste or misuse of water in the course of its distribution and use.

Water users are roughly classified in the order of precedence, domestic and sanitary, trade and manufacturing, power, canals and inland navigations, fisheries and minor purposes.

A sketch of the surface water sources of England and Wales is given, and of the way they are at present utilised, with the defects arising from the lack there is of full and accurate knowledge of their capabilities and the consequent lack of system in their allotment. Evidence is given of the growing recognition of the great importance of this matter of the systematic acquirement of accurate knowledge of its water resources, and of their proper conservation and allocation, which has resulted in the enquiry into it recently made by the Board of Trade Committee on the Water Resources of England and Wales.

It is hoped that in the Report of that Committee, recommendations will be made for arranging an accurate survey of all the water resources and water needs of the whole country, for relating all grants of powers or rights over water sources to a national water-policy founded upon the knowledge so gained and for preventing the pollution, improper use or waste, of any water source.

The Paper urges upon all interested in water supplies a thorough study of, and active interest in, this great question, that the recommendations of the Board of Trade Committee, even if they be not ideal, may run no risk of becoming a dead letter.

Mention is made of the great necessity there is for all local water authorities constantly to measure the water sources under their control and the water they distribute, for without this no real economies can well be effected.

Finally, water authorities are urged to institute and carry out careful and systematic waste inspection in connection with their distribution systems and to try and educate the individual consumer of water to recognise that, though it may not touch his pocket as directly, it is as much against his own interest as a ratepayer, to tolerate misuse of water or waste through defective leaky fittings in his house as it is to leave gas burning or electric lights on when they are not needed.

THE ROYAL SANITARY INSTITUTE.

FOUNDED 1876.

FOLKESTONE.

Place of Meeting for the Congress and Exhibition of the Institute, 1921.

By ARTHUR J. CROWHURST, Editor of the *Folkestone Herald.*

FOLKESTONE is one of the best-known English seaside resorts, and it has undeniable claims to be regarded as one of the most delightful. Beautifully situated on the coast of South-East Kent, it possesses a salubrity of climate and a charm of aspect which commend it to holiday-makers of varied tastes, whether they are in quest of health or pleasure. With its admirably equipped harbour, the property of the South Eastern Railway Company, it is one of the principal " gateways " to the Continent, the route via Folkestone and Boulogne being, indeed, the shortest between the two great capitals of the Entente—London and Paris.

It is not a town of mushroom growth, but a place whose antiquity dates back through the dim vista of the centuries even to those remote times when the Romans were an all-conquering people, carrying their civilising habits and methods to other races.

Folkestone was a place of note in the reign of Edward the Confessor, and in the time of the Domesday Book, in the fourteenth year of the reign of William the Conqueror, it was credited with having five churches. Prior to the accession of Henry I., in 1100, it became a limb of the Cinque Port of Dover.

In 1199 the reigning monarch granted the town a market, and in 1300 the master of a Folkestone boat was mentioned in the King's " wardrobe account" for services rendered. In 1238 the Cinque Ports and their limbs had to furnish 57 ships and their crews for the service of the Crown, and of these Folkestone had to provide a round dozen. Therefore it may be claimed that the town played a notable part in the early stages of the formation of the British Navy. In recognition of its patriotic services of those ancient times Folkestone now, in common with those other places included in the "League of the Cinque Ports," has the right to send its representatives, or " combarons," as they are rather picturesquely styled, to the Coronation in Westminster Abbey.

Folkestone was first granted a charter of incorporation in 1313, this being confirmed in 1327 by Edward III. In 1336 the actual writ to return members to Parliament was sent to Folkestone amongst other towns. In his history Wilks wrote that writs were addressed to Bristol and other

southern towns to send members to confer on the question of the defence of the realm, and the fact that Folkestone was included amongst those towns is evidence that it was even at that date a place of considerable importance. Passing to a later date, we find Defoe, in his " Journey through England " (1725), saying : " From Dover along the Sea Coast I passed by a miserable fishing Town called Folkston, miserable in its appearance. Yet I was told there are above Three hundred Sail of Fishing Boats belonging to it."

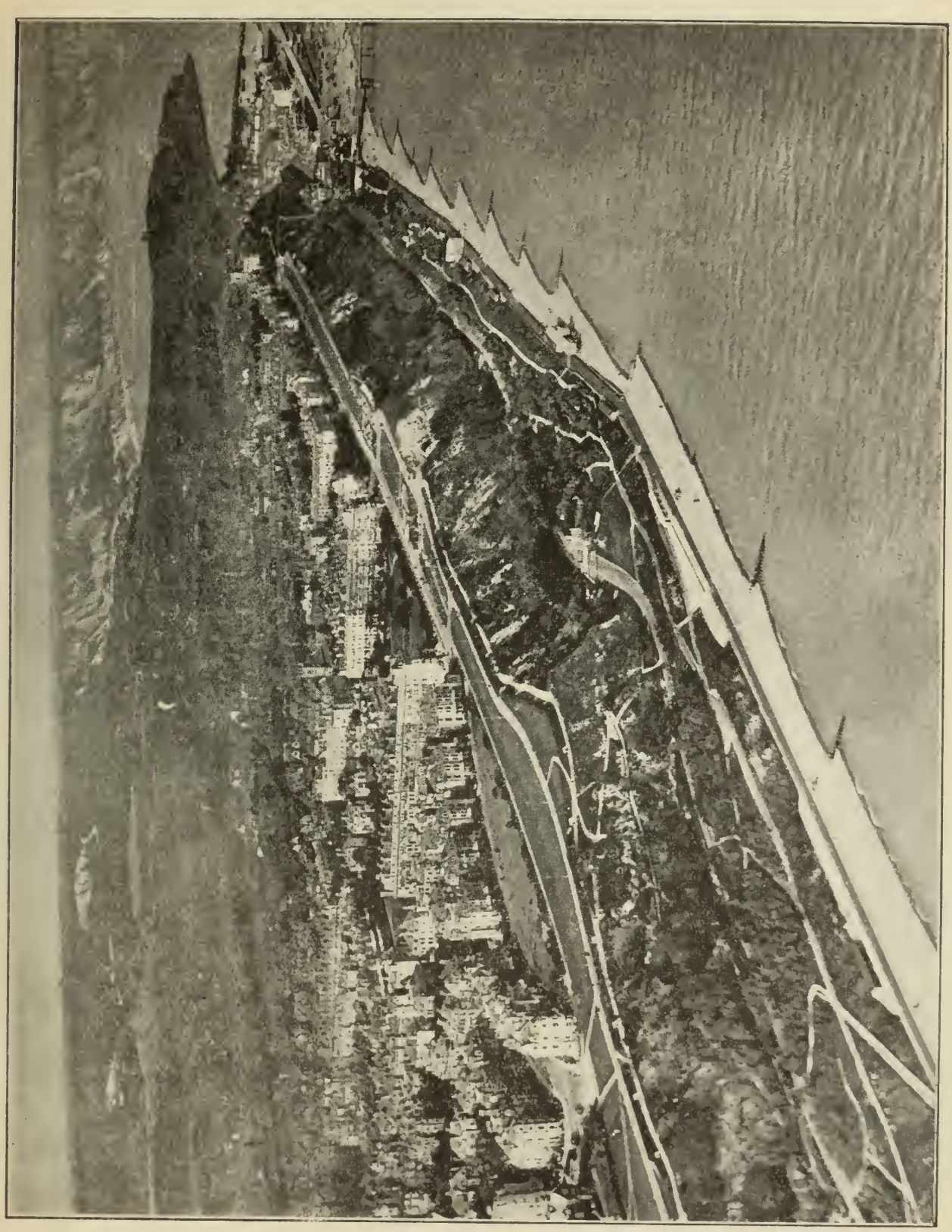
More complimentary than the tautological Defoe, Seymour, in his ' Survey " (1776), described Folkestone as " wealthy and populous," adding that it was " noted for the multitude of fishing boats that belong to its harbour."

Hasted, in his " History of Kent," published in 1799, was more explicit, stating that there were 450 houses and 2,000 inhabitants. It may here be added that in 1861 the population was 8,507, and at the 1911 census it was returned as 33,495.

Of course, the Folkestone of the present day is vastly different from the Folkestone which was the subject of Defoe's lugubrious description. To modern Folkestone the most glowing tribute has been paid by one of the greatest of our English writers, viz., Charles Dickens. The famous author found inspiration for some of his best work whilst staying in Albion Villas, at a house which is now named " Copperfield."

Charles Dickens wrote : " It is one of the prettiest watering places on the South Coast ; the situation is delightful, the air is delicious, and the breezy hills and downs, carpeted with wild thyme and decorated with millions of wild flowers, are, on the faith of a pedestrian, perfect. You can sit at your open window on the cliff overhanging the sea beach, and have the sky and ocean, as it were, framed before you like a beautiful picture, but with such movements in it, such changes of light upon the sails of the ships and wake of steamboats, such dazzling gleams of silver far out to sea, such fresh touches in the crisp wave tops as they break and roll towards you, a picture with such music in the billowy rush upon the shingle, such charms of sight and sound, as all the galleries upon earth can but poorly suggest. If, therefore, you want to come out of town and live a life of perfect repose, or see it lived, or to breathe sweet air which will send you to sleep at a moment's notice at any period of the day or night, or to disport yourself upon or in the sea, or to scamper about this part of Kent, or to come out of town for the enjoyment of any of these pleasures, then come to Folkestone."

The major portion of the town is built upon ground considerably above the sea level, on the West Cliff and the East Cliff, but there is a sheltered part in the valley between those two eminences or plateaux, and there are also residences cosily situated at the foot of the cliffs, some with gardens



BIRDSEYE VIEW OF FOLKESTONE. *(Aerofilms Limited.)*

extending down to the foreshore. On the higher ground, in parts, building development has extended inland to the verdant slopes of the North Downs, which afford to the whole town a valuable protection against the cold breezes from the north. Thus Folkestone may be said to have a double climate, being bracing generally, but in some districts mild and genial.

The principal promenade is the Leas, situated on the edge of the West Cliff—a delightful expanse of admirably trimmed lawns, such as might well have been in the mind of Keats when he wrote :—

"Now morning from her orient chamber came ;
And her first footsteps touched a verdant hill,
Crowning its lawny crest with amber flame."

At various seasons of the year, and during most week ends, this promenade is thronged with fashionably attired residents and visitors.

Other parades include the Marine Walk, a promenade constructed in recent years by the present Earl Radnor, the Lord of the Manor, to whom and his forebears Folkestone is greatly indebted for the judicious planning of the front and the residential parts of the town. The Marine Walk is built upon a substantial sea wall, which acts as a barrier against the inroads of the sea, and protects the ornamental grounds lying between the foreshore and the Lower Road, which skirts the foot of the cliff, on the tree-adorned face of which are numerous delightful walks.

Some of these latter paths wind up and down the cliff, thus affording a means of access to and from the Leas. But it has been felt in recent years that provision should be made whereby the beach should be still more accessible from the Leas—or *vice versa*—and accordingly a new Zigzag Path on ornamental lines has been constructed. At convenient points there are two lifts, operated on the water balance plan, to convey passengers up and down the cliff.

On the East Cliff there is another spacious promenade commanding glorious views of sea and land, and leading to the picturesque Warren, otherwise known as "Little Switzerland." Part of the East Cliff and the whole of the Warren—altogether an area of about two hundred acres—have recently been given to Folkestone by Lord Radnor, and works of improvement are now in hand.

Reverting to the Leas, until about seven years ago that promenade was the property of Earl Radnor, but it has been taken over by the town on a lease of 999 years at a peppercorn rent, such lease also including the cliff. The road at the foot of the cliff, the gardens that border the road on the south side, the Marine Walk, and the foreshore are still held by Lord Radnor, but it is not improbable that the whole of the front and the beach will eventually be acquired by the Corporation.

Some of the older streets near the harbour are of a narrow and tortuous character, bearing testimony to their age, but the greater and more modern part of the town is admirable in design. Trees adorn many of the streets, in some of which are grass plots and flower beds which add materially to the generally pleasing environment.

Castle Hill Avenue is a beautiful boulevard of generous proportions, with four rows of trees, two roads, and a central walk bordered on either side with grass plots. There are few towns which possess so fine an avenue.

Spacious and splendidly equipped hotels form one of the prominent features of Folkestone. Very few seaside resorts are so well provided for in this respect. There are also boarding houses and apartment houses to suit all requirements and purses.

Members of the Institute will be specially interested in what Folkestone is doing in reference to housing. The Town Council has a scheme well in hand ; a site in the north-east quarter of the borough has been purchased from Lord Radnor, and two hundred houses of modern design and con-

THE LEAS (LOOKING EAST).
(Halksworth Wheeler.).

venience are being erected. The whole scheme, as approved of by the Ministry of Health, embraces 250 houses of various types, but the contracts entered into up to the present are for 200 dwellings. The layout has been so planned that when complete the estate will constitute a pleasant garden suburb of imposing proportions, with ample air space, recreation grounds for both adults and juveniles, and a quiet retreat for the old folks. A score or more of the dwellings are already occupied. To meet the capital outlay a loan of £211,000 at 6 per cent. has been obtained.

The houses are mainly five-roomed and six-roomed cottages, the weekly rents being 11s. and 13s. 6d. respectively, tenants paying rates. The site is about a mile from the centre of the town, and is bounded on the western side by the main road to Canterbury.

On a smaller scale is the Sir Philip Sassoon housing scheme, which is already approaching conclusion. Sir Philip Sassoon, C.M.G., who is the Member for Hythe (of which Parliamentary Borough Folkestone forms the greater part), acquired some land near the Harbour, and provided the capital for the erection of 33 dwellings, the management of the scheme being placed in the hands of a Committee of Public Utility. They are being erected at a cost of not more than £750 each. The rent of the cottages is 12s. a week and that of the flats 10s. a week, the tenants paying the rates in each case.

With regard to the public buildings of Folkestone, the Town Hall is conveniently situated in Guildhall Street, at the eastern end of Sandgate Road. The large hall is used for concerts and other entertainments. The Drill Halls, where the Exhibition in connection with the Congress is to be held, form a spacious building standing just off Shellons Street in a central part of the town. They were built as a memorial to Queen Victoria.

The principal place of entertainment is the Pleasure Gardens Theatre, which is the main part of the large building erected in Bouverie Road West in 1886 for the Art Treasures Exhibition. It is admirably equipped and furnished, and performances are given throughout the year by London and leading provincial touring companies. The spacious gardens adjoining are used for lawn tennis, croquet, and other games.

Picture lovers are well catered for at the Central Picture Palace, the Playhouse, the Electric Theatre, and on the Victoria Pier, where also other entertainments are given according to the season. Other amusement resorts include the Leas Pavilion, the County Rink, and the Woodward Institute, and several of the hotels are used for entertainments and dances.

Ample provision is made for band performances. In the summer these are given two or three times daily in the bandstands on the open Leas, and there are orchestral performances in the Leas Concert Hall two or three times daily throughout the year. This hall has just been enlarged, accommodation now

LEAS ENTRANCE TO CASTLE HILL AVENUE, SHOWING THE HARVEY STATUE.

being provided for about 800 people. In the summer occasional band performances are also given in the Marine Gardens, near the harbour.

Under the Folkestone Corporation Act, which was passed through Parliament last year, the town has powers for, *inter alia*, the erection of a band pavilion on a substantial scale, and that scheme will be pressed forward when conditions are more favourable.

The recreation grounds include Radnor Park, presented to the town by the Lord of the Manor, and admirably laid out with lawns and shrubberies. This pleasaunce, twenty-one acres in extent, is conveniently situated close to the Central railway station, and is in great demand for lawn tennis, bowls, and other games.

There is a capital Cricket and Football Ground on the Cheriton Road, within easy reach of the town—lawn tennis and bowls are also played in this enclosure—and the excellent eighteen-holes course of the Folkestone Golf Club is also in the proximity of the town. It is hoped that in the near future a considerable area of land at the western end of the Leas will be further developed as a sports ground, where polo, lawn tennis, and other games can be played.

Sufficient has already been written to show that Folkestone offers facilities for a full round of entertainments and pastimes. Of course, in the summer sea bathing is one of the leading features. Ample cabin accommodation is

provided, and bathing from tents is also very popular. In the early morning and late in the evening bathers can disrobe and robe on the open beach, and during the whole of the day a screen enclosure is available free to all of the male sex. Indoor bathing can be enjoyed at the Bathing Establishment.

Folkestone offers noteworthy advantages as a centre from which other places of interest can be easily reached. Canterbury (with its grand Cathedral), Hythe (with its delightful Canal and the Church Crypt, containing a remarkable collection of skulls), and Dover (with its Castle and National Harbour) are amongst these places, and the adjoining rural districts are characterised by many charming features. With daily steamboat services between Folkestone and Boulogne and also between Folkestone and Flushing, a trip to France or to Holland becomes a simple matter, and Belgium can easily be visited via Dover and Ostend.

Not the least interesting part of the town is the fishermen's quarter, close to the harbour, in a part of which the fishing boats find shelter. The fleet engaged in the industry is a considerable one, many of the craft being fitted with motors.

The municipal services include a Refuse Destructor of the Horsfall type, with adjuncts for the making of fish manure, fish oil, and brickmaking, a considerable proportion of the refuse being converted to good use.

The Water, Gas, and Electric Light Supplies are in the hands of separate companies. The water, which is of admirable quality and abundant in quantity, is drawn from the Alkham Valley, in the healthy altitude of the North Downs.

The town possesses a well-appointed Sanatorium, situated on the East Cliff, also an excellent Hospital, known as the Royal Victoria Hospital, pleasantly located overlooking Radnor Park. The latter, which was founded in 1847, is supported by voluntary contributions.

The following table gives the chief vital statistics for the past ten years :—

Year.	*Birth Rate.*	*Deaths under one year Rate per 1,000 Births.*	*Death Rate.*
1910 ...	16·1 ...	60·8 ...	9·9
1911 ...	17·3 ...	115·3 ...	11·5
1912 ...	17·5 ...	65·4 ...	11·8
1913 ...	17·9 ...	65·3 ...	10·8
1914 ...	17·7 ...	61·1 ...	10·8
1915 ...	19·7 ...	114·3 ...	15·5
1916 ...	21·9 ...	78·8 ...	13·8
1917 ...	19·2 ...	83·3 ...	14·7
1918 ...	18·5 ...	68·9 ...	16·1
1919 ...	19·6 ...	63·3 ...	12·2

It cannot be said that Folkestone is opulent in monuments or statuary, but there stands at the Leas end of Castle Hill Avenue an effigy in bronze erected in honour of a great celebrity. This is the statue of Sir William Harvey, famous as the discoverer of the circulation of the blood, who was born in Folkestone on April 1st, 1578. He died on June 3rd, 1657, and was buried at Hempstead, in Essex.

In the near future there will probably be another monument on the Leas. This will be Folkestone's War Memorial, which it is proposed to erect at the eastern end of the Leas, close to the top of the Slope Road, down which hundreds of thousands of soldiers marched on their way to the harbour, there to embark for the battlefields of France and Belgium.

Folkestone was a port of great value during the great war, as may be gathered from the following figures showing the numbers embarking and landing at the harbour from the commencement of hostilities to the signing of the peace :—

British officers and men, 9,253,652 ; Allied officers and men, 537,523 ; civilians engaged in Red Cross and other work, 846,919 ; German prisoners of war, 3,592 ; total, 10,641,686. (These figures are culled from Dr. J. C. Carlile's interesting book, " Folkestone during the War.")

It will be seen therefore that it is specially fitting that Folkestone should possess an imposing War Memorial. There has been delay for various reasons, but there is ground for hoping that the Memorial will become an accomplished fact at no distant date.

The town was the scene of one of the worst air raids of the war. This was the daylight raid by Gothas on May 25th, 1917. Seventy-one people were killed, and over one hundred injured. Adding three killed at Cheriton and two killed at Hythe, the total fatalities were 76 (exclusive of a number of soldiers killed at Shorncliffe Camp). In the whole war there was only one other air raid on England in which the casualty list was heavier.

THE THIRTY-SECOND CONGRESS OF THE INSTITUTE WILL BE HELD IN FOLKESTONE FROM JUNE 20TH TO 25TH, 1921.

PRESIDENT OF THE CONGRESS.

THE RIGHT HON. THE EARL OF RADNOR.

Chairman of Local Committee.

THE RIGHT WORSHIPFUL THE MAYOR OF FOLKESTONE (Alderman R. G. WOOD, J.P.).

Hon. Local Treasurer.

W. H. ROUTLEY (Borough Treasurer).

Hon. Local Secretaries.

A. F. KIDSON, Town Clerk.

M. G. GEORGE BATEMAN, M.R.C.S., D.P.H., Medical Officer of Health.

Popular Lecture.

By Professor EDWARD MELLANBY, M.A., M.D., on "Vitamines and their Relation to Health."

Officers of Sections and Conferences.

A.—Sanitary Science and Preventive Medicine.

President: SIR LESLIE MACKENZIE, M.A., M.D., LL.D., F.R.C.P.E.

Recording Secretary: W. J. HOWARTH, C.B.E., M.D., Ch.B., D.P.H., M.O.H., City of London.

B.—Engineering and Architecture.

President: MAJOR W. H. PRESCOTT, M.Inst.C.E., M.P.

Recording Secretary: W. C. TYNDALE, O.B.E., M.Inst.C.E., War Office, Whitehall, S.W.

C.—Hygiene of Maternity and Child Welfare, including School Hygiene.

President:

Recording Secretary: CHARLES PORTER, M.D., B.Sc., M.O.H., St. Marylebone, N.W

D.—Personal and Domestic Hygiene.

President: THE MAYORESS OF FOLKESTONE (Mrs. Reginald G. Wood).

Recording Secretary:

E.—Industrial Hygiene.

President: THE RIGHT HON. VISCOUNT BURNHAM, K.C.V.O.

Recording Secretary: E. H. SNELL, M.D., B.Sc., D.P.H., M.O.H., Coventry.

I.—Representatives of Sanitary Authorities.

President : The Right Worshipful The Mayor of Folkestone.

Recording Secretary : A. Wellesley Harris, M.R.C.S., D.P.H., M.O.H., Lewisham, S.E.

II.—Medical Officers of Health.

President : J. Wright Mason, M.B., C.M., M.R.C.S., D.P.H.

Recording Secretary : Alfred Greenwood, M.D., D.P.H., B.Sc., M.O.H., Kent C.C., Sessions House, Maidstone.

III.—Engineers and Surveyors.

President : H. Percy Boulnois, M.Inst.C.E.

Recording Secretary : Edward Willis, Assoc.M.Inst C.E., F.S.I., Town Hall, Chiswick, W.

IV.—Veterinary Inspectors.

President : Major-General Sir L. J. Blenkinsop, K.C.B., D.S.O., Director-General, Army Veterinary Service.

Recording Secretary : J. R. Hayhurst, M.R.C.V.S., D.V.S.M., Metropolitan Cattle Market, Islington, N.

V.—Sanitary Inspectors.

President : G. M. Pettit, Chief Sanitary Inspector, Kensington.

Recording Secretary : J. H. Clarke, Chief Sanitary Inspector, Town Hall, Chiswick.

VI.—Health Visitors.

President : Miss Gertrude Tuckwell, J.P., President, Women Sanitary Inspectors and Health Visitors' Association.

Recording Secretary : Miss L. M. O'Kell, Health Visitor, Town Hall, Paddington, W.

VII.—Rat Officers.

President :

Recording Secretary : G. L. Moore, Kent County Organisation Rats Officer, 27, High Street, Maidstone.

Members proposing to submit Papers for reading in Sections or Conferences, are asked to send in the titles of their Papers, at once, and the Manuscripts for consideration of the Committee by May 16th.

The Health Exhibition will be held in the Drill Hall from June 20th to 29th, 1921.

REVIEWS OF BOOKS.

The Assessment of Physical Fitness.*

This little book consists mainly of tables of measurements with a short preliminary explanatory statement. The former give accurate measurements of the trunk, height, weight, circumference of chest, and vital capacity, for both sexes within very wide limits of variation ; running in the case of weight from just under 42 to over 322 lbs. in the case of males, and from just below 24 to over 217 lbs. in the case of females. Such a wide range of accurate observation is obviously of the greatest value. The different measurements are all correlated in the various tables, and the figures are given in both the Imperial and Metrical Systems, rendering the book extremely handy for rapid use in the consulting room.

As regards height, it is to be noted that only trunk height, and not total height is given. From a military point of view this of course is a serious omission, the relationship between full height and length of leg being of considerable importance in the case of the soldier. It is further to be noted that trunk height, as used by Dr. Dreyer, includes the head and neck. This appears rather illogical. Surely if the legs are left out it would have been wiser to take only that portion of the body that houses the thoracic and abdominal viscera. The introduction of say another eight inches, about 1/5th of the total trunk height, gives unnecessary room for error. The *vertebra prominens* provides a very good upper landmark for estimating the real trunk height. The chest measurement is taken in the ordinary resting position. This does not appear to present much advantage over the ordinary military method of taking the dimensions of the fully expanded and fully collapsed chest, which gives the range of expansion, a useful check on the vital capacity as taken by the spirometer.

This latter measurement is valuable, but it must be remembered that it is distinctly liable to fallacy. There is a great deal in being able to blow. A man who has been in the habit of using a blow pipe, or play a wind instrument, will probably show a higher figure on the spirometer than an athlete introduced to the instrument for the first time. The estimation of the range of expansion would be a useful corrective here.

These few criticisms apart, there can be no doubt of the value of Dr. Dreyer's work. His reputation is a sufficient guarantee that his figures are as free from error as any human measurements can be, and accurate measurement of the human body has been strangely neglected in the past, and is much needed in the present.

C. H. M.

The Principles of Preventive Medicine.†

This book is written for the use of medical students and medical practitioners, and should prove of the greatest value to them. The public are

* The Assessment of Physical Fitness, by Georges Dreyer, C.B.E., M.A., M.D., in Collaboration with George Fulford Hanson. 8vo., 115 pp. London. 1920. Cassell & Co. Price 10s.

† The Principles of Preventive Medicine, by R. Tanner Hewlett, M.D., F.R.C.P., D.P.H., and A. T. Nankivell, M.D., D.P.H. 8vo., 536 pp. London. 1920. J. & A. Churchill. Price 21s.

now being continually told that the prevention of disease is as much a function of the medical profession as the cure of disease, but the general practitioners, who form the bulk of the profession, have hardly yet begun to realise that the times are changing. "The Principles of Preventive Medicine" should help to eradicate the old belief that the Health Service is mainly concerned with drains. Ethel in "The Young Visitors" remarked, "I must put some red rouge on my face because I am very pale owing to the drains in this house"; but the M.O.H. of to-day would think first of causes other than the drains to account for Ethel's pallor—her defective teeth, enlarged tonsils, insufficient sleep, and improper food would call first for remedy. Neither the public nor the profession should any longer regard the public health service as drain experts and nothing more.

A glance at the contents of the book will show that preventive medicine is mainly concerned with the following subjects :—Eugenics and Maternity. Infant Mortality and the Medical Care of Infancy. The Welfare and Health of the Child under 5 years, and of the School Child. The Health of Adolescents and Adults. The Housing Problem and Overcrowding. Foods, Alcohol. Water Supplies. Infectious Diseases and their control. Preventive Inoculations. Disinfection. Statistical Methods.

All these subjects are ably and completely dealt with by the authors, and the medical practitioner will learn from them how he may best co-operate with the local health authorities in the campaign for the prevention of disease, which the public now expects of him. There can be no doubt that the young man entering the medical profession, who carefully studies the principles and practice of Preventive Medicine, broadens his views of what the science of medicine is really capable; he must begin to realise that his opportunities as a practitioner to study the beginnings of disease are likely, if taken full advantage of, to contribute much useful knowledge on how to maintain health in our great industrial populations; and he tends to rise above the narrow conception of an earlier day, that the only aim and function of the practising physician is to cure his patient of established disease—the health and efficiency of the people at large being at least outside his purview, even if not in conflict with his own immediate interests.

L. C. P.

Prevention of Venereal Disease.*

Sir Archdall Reid had several reasons for writing this book : (1) He desired in the first place to show that the venereal disease problem is very urgent. In proof of this he declares that at the present moment something like every other person in the United Kingdom has suffered, or is suffering, from venereal disease, and that "more than half the male population suffers at one time or another." Any "average member of the community" must, he states, conclude that this estimate is not excessive because "when he was young he was on confidential terms with a certain number of young men. How many of these confessed to having suffered from venereal

* The Prevention of Venereal Disease, by Sir G. Archdall Reid, K.B.E., M.B., C.M., F.R.S.E. 8vo., 447 pp. London. 1920. William Heineman. Price 15s.

disease ? " The striking feature of this method of calculation, which is here set out fully and as it appears in the book, is its simplicity. The author is, apparently, satisfied also as to its reliability. (2) Sir Archdall Reid's second object is to prove that it is futile to attempt to secure chastity and avoidance of infection by teaching. Chastity is merely a convention, and to create a bias towards it, teaching must be begun in early childhood. " But this teaching, to be efficient, must obviously be given by adults to children, and good teaching by adults in matters sexual is hopelessly out of reach in England where convention permits only preaching." (3) Since it is hopeless to expect any improvement in public morality and consequently any reduction in venereal disease, the only course open, according to Sir Archdall Reid, is to accept the situation, to give up the attempt to teach chastity and instead teach young and old, girls and boys, men and women, gentle and simple, how to practise what he calls " sanitation," *i.e.*, prevention of infection with venereal disease by means of antiseptics. (4) The author's final object was to pillory and demand the punishment of various persons and bodies who refuse to accept his views, and who tried, unfairly as he considers, to prove him wrong. Lord Sydenham and Lord Sandhurst feel the lash because they took a view contrary to that of Sir Archdall Reid in the course of a debate in the House of Lords : so also, for other reasons, do Viscount Astor, Sir Malcolm Morris, and Colonel Harrison of the Ministry of Health. There is a strong indictment of the War Office that failed to make proper use of the method of prevention during the war. The Ministry of Health is treated with scorn because it will not give official recognition to the views of Sir Archdall Reid, and issue orders to the local authorities to teach, and to the civil population to practise, what Sir Archdall Reid preaches. To the National Council for Combating Venereal Diseases, whose chief fault appears to be that they cannot yet feel that the time has come to accept Sir Archdall Reid's counsel of despair in regard to morality and venereal disease, and adhere to a scheme that is not his and that he cannot approve, special treatment is meted out. Special language, contemptuous, derisive, and scornful, is used in referring to them and special punishments will, it is gathered, be provided either here or hereafter. The book is most ably written and will doubtless have a large sale. Its appeal will probably be fairly wide but if the tone and the temper had been better : if its point of view were less materialistic : if there were here and there a little lightness of touch, a little kindliness and softness, the appeal would be wider and the book, though the subject is an unpleasant one, pleasanter to read. It bears the endorsement of the Society for the Prevention of Venereal Disease, and has an introductory chapter by Sir Bryan Donkin. In this, which is quite short, he says practically all that Sir Archdall Reid says in 16 chapters, 7 appendices, a 20 page summary, and a 9 page preface.

C. P.

MEETINGS HELD.

Sessional Meetings.

Exeter.—The meeting was held in the Guildhall on Friday, January 28th, at 4.30 p.m., when a discussion on "The Sanatorium Question" was opened by E. Ward, M.D., F.R.C.S., Tuberculosis Officer, Devon County Council. The chair was taken by Prof. H. R. Kenwood, C.M.G., M.B., F.R.S.E., Chairman of Council.

On Saturday, January 29th, a short discussion on "Housing" was opened by George Adkins, L.R.C.P., D.P.H., Medical Officer of Health, Devon County Council, and Arthur E. Bonham, Chief Sanitary Inspector, followed by a visit to new houses and insanitary areas.

Manchester.—The meeting was held in the College of Technology, on Friday, February 25th, at 7 p.m. Discussions took place on "The Use of Open Fires for Domestic Heating," opened by Mrs. Margaret Fishenden, D.Sc., "The Present Position of Smokeless Fuels," by Captain F. S. Sinnatt, M.B.E., M.Sc., F.I.C., and on "Air Pollution," by Prof. J. Radcliffe, M.Sc. (Tech.).

On Saturday, February 26th, visits were made to new houses erected by the Manchester Corporation.

Examinations.

Since the last issue the following examinations have been reported :—

Melbourne, Feb. 19th and 20th, 1920.
Calgary, Alberta, June 19th, 1920.
Melbourne, Nov. 9th and 11th, 1920.
Cape Town, Nov. 26th and 27th, 1920.
Port Elizabeth, Nov. 26th and 27th, 1920.
Durban, Nov. 26th and 27th, 1920.
Regina, Sask, Dec. 17th, 1920.
Hereford, Jan. 21st and 22nd, 1921,
Plymouth, Jan. 28th and 29th, 1921.
Preston, Feb. 4th and 5th, 1921.

For Inspectors of Meat and other Foods :—

Cape Town, December 10th and 11th, 1920.
Johannesburg, December 10th and 11th, 1920.
Manchester, February 18th and 19th, 1921.

At these examinations 205 candidates presented themselves, and the following were awarded certificates :—

Sanitary Science as applied to Buildings and Public Works.

Maternity and Child Welfare Workers.

Cook, Frances, *Bideford.*
Dinsley, Kathleen, *Bristol.*

Inspectors of Nuisances.

Bennett, George, *Fairfield.*
Barnard, Muriel Elizabeth, *Kew.*
Bendle, Sydney Philip, *Barnstaple.*
Bowden, Arthur James, *Porth.*
Byres, Robert, *Pietermaritzburg.*
Charge, James Edwin, *Brunswick.*
Chester, Edith Mary, *Elsternwick.*

CLARK, WILLIAM ERNEST, *Ripley.*
CLERK, JOHN DONALD, *Plymouth.*
COLMAN, HARRY THOMAS, *Pietermaritzburg.*
COWEY, JOHN, *Calgary.*
CONCHAR, JOHN WILLIAM, *Blackley.*
CROFTS, ALFRED, *Moonee Ponds.*
DALGLIESH, LAWRENCE, *Hull.*
DAVIES, ALICE HILDA, *Melbourne.*
DE LIVERA, CHRISTOPHER, *Plymouth.*
DONN, JOHN HARTLEY, *Mowbray.*
FLEETWOOD, ERNEST HALL, *Calgary.*
GIBSON, LEWIS MURRAY, *Coburg.*
GOSHAM, SYDNEY ROBERT, *Observatory.*
HARDESS, WILLIAM GEORGE, *Surrey Hills.*
HARRIS, NORMAN CLIFFORD JOHN, *Redruth.*
HEAD, EDWARD JOHN, *Pontypool.*
HILL, WALTER JAMES, *Coburg.*
HILLARY, EMILY FRANCES, *Muizenberg.*
HOUSTON, ALEXANDER, *Kew.*
JAMES, ALBERT JOHN, *Gloucester.*
JONES, EDITH GWENDOLEN, *Ormond.*
LEGGETT, WILLIAM ALFRED, *Calgary.*
LUPTON, GEORGE BLACKWELL, *Pietermaritzburg.*
MACDONALD, CAROLINE, *Observatory.*
MCKENZIE, ALEXANDER, *Preston.*
MCLOUGHLIN, MARY ELEANOR, *Cape Town.*
MATSON, SARAH JANE, *Malvern.*
MITCHELL, JOHN STEVENS, *Williamstown.*
MITCHELL, MARY MARIA, *Moonee Ponds.*
MORGAN, GEORGE ALBERT, *Treherbert.*
MORRIS, WILFRED, *Bude.*
MOUNSEY, JAMES DALZELL, *Melbourne.*
PAINE, RICHARD WILLIAM WHITFIELD, *Cape Town.*
PEARSON, WILFRED, *Calgary.*
PHILLIPS, THOMAS VEALE, *Williamstown.*
PHILP, EDITH MAUD, *Canterbury.*
PILLIDGE, WALLACE, *Calgary.*
POOLE, DICK, *St. Kilda.*
PRICHARD, JOHN SEYMOUR, *Hereford.*
PRIDAY, STELLA MURIEL, *Auburn.*
PROSSER, WALTER HENRY, *Bridgend.*
RAINBOW, ANNIE MATILDA, *Merbein.*
RAVESTEYN, WILLIAM ANDREW, *Calgary.*
ROSE, VICTOR PERCY, *Beauford.*
SHAW, WILLIAM JAMES, *Fitzroy.*
SMITH, JESSIE, *Beswick.*
STEPHENS, HENRY CHARLES, *Williamstown.*
STEWART, CHARLES GRANT, *Caulfield.*
STUBBINGTON, FREDERICK WILLIAM, *Melbourne.*
SUTHERLAND, JOHN HECTOR, *Footscrag.*
SUTTON, CHARLES EDWARD, *Moose Jaw.*
SYMONDS, HELENA CAROLINE, *Kew.*
TAYLOR, FRANK, *Salford.*
TROUGHTON, WALTER, *Moose Jaw.*
TUCKER, NORMAN S., *Torquay.*
WALLER, HAROLD, *Oldham.*
WEBSTER, SARA ANNE, *Melbourne.*
WHITE, ARTHUR JOSEPH, *Melbourne.*
WHITE, FREDERICK WILLIAM, *Moonee Ponds.*
WILLIAMS, IVOR OWEN, *Dowlais.*
WOOD, THOMAS, *Nailsworth.*
WOODCOCK, JOHN RALPH, *Accrington.*

Women Health Visitors and School Nurses.

BARNARD, MURIEL ELIZABETH, *Kew.*
CHESTER, EDITH MARY, *Elsternwick.*
DAVIES, ALICE HILDA, *Melbourne.*
DAWBER, ETHEL HILTON, *Rochdale.*
DONNELLAN, MARGARET, *Melbourne.*
DORRICOTT, MARY, *Shrewsbury.*
HILL, LIDA, *Windsor.*
MATSON, SARAH JANE, *Malvern.*
MITCHELL, MARY MARIA, *Moonee Ponds.*
MOORE, HELEN, *Westhoughton.*
MOUNTFORD, MURIEL, *St. Helens.*
PHILP, EDITH MAUD, *Canterbury.*
PRIDAY, STELLA MURIEL, *Auburn.*

RAINBOW, ANNIE MATILDA, *Merbein.*
RAVENSCROFT, ELIZA, *St. Helens.*
ROBINSON, HANNAH ELLEN, *W. Bromwich.*
ROWLANDS, EDITH, *Newtown.*
ROTH, NORAH FLORENCE ORME, *St. Austell.*
SPELLER, BEATRICE MAY, *Liverpool.*
SYMONDS, HELENA CAROLINE, *Kew.*
WEBSTER, SARA ANNE, *Melbourne.*

Inspectors of Meat and other Foods.

GRAHAM, WILLIAM GEORGE, *Pretoria.*
JONES, SYDNEY DAVID, *East London.*
PILDITCH, GERALD, *Pretoria.*

Special South African Certificate.

LAKIN, ALEXANDER, *Johannesburg.*
MOORE, HENRY JAMES, *Johannesburg.*
SUCKSMITH, RICHARD, *Johannesburg.*
THOMPSON, CHARLES, *Randfontein.*

FORTHCOMING MEETINGS.

SESSIONAL MEETING.

London.—Tuesday, March 8th, at 5 p.m. Discussions on "The Sanitary Engineering Side of Town Planning," to be opened by Edward Willis, Assoc.M.Inst.C.E., F.S.I., Engineer and Surveyor, Chiswick, and "Town Planning of Built-on Areas," opened by George Pepler, F.S.I., Town Planning Inspector, Ministry of Health. The Chair will be taken by Professor H. R. Kenwood, C.M.G., M.B., F.R.S.E., Chairman of Council.

STUDENTS' LECTURES.

The Special Course arranged for Army Officers and Professional Men on Food and Meat Inspection, will commence on Monday, April 11th.

ORDINARY GENERAL MEETING.

The Ordinary General Meeting will be held at the Institute on Wednesday, April 27th, at 4.30 p.m.

LECTURE TO THE INSTITUTE.

Will be delivered on Wednesday, April 27th, at 5.30 p.m.,
by Colonel Charles H. Melville, C.M.G., M.B., D.P.H., R.A.M.C.,
on "Some Lessons of the War."

FOLKESTONE CONGRESS AND EXHIBITION, JUNE 20TH TO 25TH, 1921.

A descriptive article on the town, and a list of the officers of the Congress is given at the beginning of this supplement, page 57.

Health Week.

His Majesty the King, and Her Majesty the Queen, have graciously accorded their patronage to Health Week, which is to be held in October. The Right Hon. The Lord Mayor of London has consented to act as Chairman of the General Committee.

Members of the Institute are invited to co-operate in promoting the success of the movement. Those prepared actively to assist are asked to send in their names to the Secretary.

Examinations.

In Sanitary Science as applied to Buildings and Public Works, for Inspectors of Nuisances, Maternity and Child Welfare Workers, Women Health Visitors and School Nurses, and School Hygiene, including Elementary Physiology, will be held at :—

Bristol, March 4th and 5th.	Belfast, April 22nd and 23rd.
Portsmouth, March 11th and 12th.	London, April 29th and 30th.
Edinburgh, March 18th and 19th.	Manchester, May 6th and 7th.
Aberystwyth, April 8th and 9th.	Alberta, Canada, April, 1921.
Sheffield, April 15th and 16th.	Hong Kong, June, 1921.

For Inspectors of Meat and other Foods :—
London, May 20th and 21st.

COLONIAL NOTE.

Extract from—

New Zealand Health Bill, 1920.

Sect. 25.—Appointment of Sanitary Inspectors.

(*b*) After the commencement of this Act no person shall be appointed as a Sanitary Inspector who is not the holder of a certificate from the Royal Sanitary Institute, or who is not the holder of such other qualifications in lieu of such certificate as may be prescribed in that behalf by regulations under this Act.

Calendar for March June, 1921.

As far as at present arranged

MARCH.

2 W. Inspection and Demonstration in the District of Islington, at 2.30 p.m. Conducted by James R. Leggatt, Supt., Public Health Dept., Islington.

2 W. Lecture to Sanitary Officers, at 6 p.m. Infectious Diseases, by Joseph Priestley, M.D., D.P.H.

2 W. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Hygiene of the Home, by Mrs. S. Seekings Friel, M.D., D.P.H.

4 F. Lecture to Sanitary Officers, at 6 p.m. Methods of Disinfection, by Joseph Priestley, M.D., D.P.H.

4 F. Lecture to Meat Inspectors, at the Institute, at 6 p.m., by J. R. Hayhurst, M.R.C.V.S.

4 F. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Sociological Conditions, by Mrs. S. Seekings Friel, M.D., D.P.H.

4 F.
5 S. } Examinations—Bristol.

5 S. Demonstration—Meat Inspectors, at Metropolitan Cattle Market, at 1.30 p.m.

5 S. Inspection and Demonstration at the Lambeth Disinfecting Station, at 2.30 p.m. Conducted by Joseph Priestley, M.D., D.P.H.

7 M. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Water Supply Fittings and Ventilation in the Home, by J. H. Clarke, Chief Sanitary Inspector, Chiswick.

8 T. **Sessional Meeting,** London, at 5 p.m. Discussion on " The Sanitary Engineering Side of Town Planning," opened by E. Willis, A.M.INST.C.E., F.S.I., and on " Town Planning of Built-on Areas," opened by George Pepler, F.S.I.

8 Tu. Lecture to Sanitary Officers, at 6 p.m. Water : Composition, Pollution and Purification, by Joseph Priestley, M.D., D.P.H.

9 W. Inspection and Demonstration in the District of Chiswick, at 2.30 p.m. Conducted by J. H. Clarke, Chief Sanitary Inspector, Chiswick.

9 W. Lecture to Sanitary Officers and Health Visitors and Child Welfare Workers, at 6 p.m. Sanitary Appliances, by W. C. Tyndale, O.B.E., M.INST.C.E.

11 F. Lecture to Sanitary Officers, at 6 p.m. Details of Plumbers' Work, by Walter Scott.

11 F.
12 S. } Examinations—Portsmouth.

12 S. Inspection and Demonstration at the Express Dairy, College Farm, Finchley, at 2.30 p.m.

12 S. Demonstration—Meat Inspectors, at the Metropolitan Cattle Market, at 1.30 p.m.

14 M. Lecture to Sanitary Officers and to Health Visitors and Child Welfare Workers at 6 p.m. House Drainage, by W. C. Tyndale, O.B.E., M.INST.C.E.

16 W. Inspection and Demonstration in the District of Islington, at 2.30 p.m. Conducted by James R. Leggatt, Supt., Public Health Dept., Borough of Islington.

16 W. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Home Visiting and Advice, by Miss Alice Moss, Sanitary Inspector and Health Visitor, Battersea.

16 W. Lecture to Sanitary Officers, at 6 p.m. Calculations, Measurements and Plans and Sections, by W. C. Tyndale, O.B.E., M.INST.C.E.

17 Th. Lecture to Sanitary Officers and to Health Visitors and Child Welfare Workers, at 6 p.m. Ventilation and Warming, by Edward Willis, A.M.INST.C.E., F.S.I., Engineer and Surveyor, Chiswick, U.D.C.

18 F. Lecture to Sanitary Officers, at 6 p.m. Building Materials, by Edward Willis, A.M.INST.C.E., F.S.I.

18 F. Lecture to Meat Inspectors, at the Institute, at 6 p.m., by J. R. Hayhurst, M.R.C.V.S.

18 F. } Examinations—Edinburgh.
19 S. }

19 S. Inspection and Demonstration at Schools and Public Buildings, Chiswick, at 1 p.m. Conducted by Edward Willis, A.M.INST.C.E., Engineer and Surveyor.

19 S. Demonstration to Health Visitors and Child Welfare Workers, in the Parkes Museum, at 3 p.m. Conducted by J. H. Clarke, Chief Sanitary Inspector, Chiswick.

21 M. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Health Talks and Home Nursing, by Mrs. K. Lomax-Earp, Matron, Health Institute, Kilburn.

22 Tu. Lecture to Sanitary Officers, at 6 p.m. Building Sites, by Edward Willis, A.M.INST.C.E., F.S.I.

23 W. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Organisation and Management of Infant Welfare Centres and Clinics, by Charles Porter, M.D., B.SC., M.O.H., S. Marylebone.

25 F. **Good Friday.**

28 M. **Easter Monday.**

APRIL.

1 F. Lecture to Sanitary Officers, at 6 p.m. Sewerage, by H. C. Adams, M.INST.C.E.

1 F. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Official and Voluntary Agencies Administering to Child Welfare : the Children Act, by Charles Porter, M.D., B.SC.

2 S. Demonstration of Health Visitors and Child Welfare Workers, in the Parkes Museum, at 3 p.m. Conducted by J. H. Clarke

2 S. Demonstration—Meat Inspectors, at the Metropolitan Cattle Market, at 1.30 p.m.

2 S. Inspection and Demonstration at the Sewage and Destructor Works, Ealing, at 2.15 p.m. Conducted by W. R. Hicks, A.M.INST.C.E., Borough Engineer and Surveyor, Ealing.

4 M. Lecture to Sanitary Officers, at 6 p.m. Sewage Disposal, by H. C. Adams, M.INST.C.E.

4 M. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Prevention of Communicable Disease, by R. Veitch Clark, M.A., M.D., B.SC., D.P.H.

5 Tu. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Prevention of Communicable Disease, by R. Veitch Clark, M.A., M.D., B.SC., D.P.H.

6 W. Lecture to Sanitary Officers, at 6 p.m. Water Supply, Sources of Supply and Distribution, by H. C. Adams, M.INST.C.E.

6 W. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Tuberculosis, by R. Veitch Clark, M.A., M.D., B.SC., D.P.H.

6 W. Inspection and Demonstration, at 3 p.m., at Messrs. Knights' Soap Works, Silvertown, E.

7 Th. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Venereal Diseases, by Jessie Campbell, M.B., CH.B., D.P.H.

8 F. Lecture to Sanitary Officers at 6 p.m. Scavenging, Disposal of House Refuse, by W. R. Hicks, A.M.INST.C.E., Borough Engineer and Surveyor, Ealing.

8 F. } Examinations—Aberystwyth.
9 S. }

9 S. Inspection and Demonstration at Wanstead Sewage Works, at 2.30 p.m. Conducted by H. C. Adams, M.INST.C.E.

9 S. Demonstration to Health Visitors and Child Welfare Workers, in the Parkes Museum at 3 p.m. Conducted by J. H. Clarke.

9 S. Demonstration—Meat Inspectors, at the Metropolitan Cattle Market, at 1.30 p.m

11 M. Lecture to Sanitary Officers and Commissioned Officers, at 6 p.m. The Laws, By-Laws, and Regulations affecting the Sale of Food, by R. King Brown, M.D., D.P.H.

11 M. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Ante-natal Hygiene (1), by Margaret G. Thackrah, B.A., M.D., M.R.C.P.

11 M. Introductory Lecture to Commissioned Officers, at 3.30 p.m., By Colonel C. N. Melville, C.M.G., R.A.M.C.

12 Tu. Demonstration to Commissioned Officers, at Smithfield Market, at 11 am.

12 Tu. Lecture to Commissioned Officers, at 3.30 p.m. Meat Inspection, by J. R. Hayhurst, M.R.C.V.S.

12 Tu. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Ante-Natal Hygiene (2), by Margaret Thackrah, B.A., M.D., M.R.C.P.

13 W. Inspection and Demonstration at the Metropolitan Cattle Market, at 11 a.m. Conducted by J. R. Hayhurst, M.R.C.V.S., Superintendent and Veterinary Inspector.

13 W. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Care of Mother and Infant (1), by Margaret G. Thackrah, B.A., M.D., M.R.C.P.

13 W. Lecture to Sanitary Officers and Commissioned Officers, at 6 p.m. Signs of Health and Disease in Animals Destined for Food, by J. R. Hayhurst, M.R.C.V.S., D.V.S.M.

13 W. Lecture to Commissioned Officers, at 3.30 p.m. Canteen Supplies, Eggs, Butter, Cheese, Bacon, Lard, by C. L. T. Beeching, F.G.I.

14 Th. Demonstration to Commissioned Officers at Smithfield Market, at 11 a.m.

14 Th. Lecture to Commissioned Officers, at 3.30 p.m. Canteen Supplies, Tea, Coffee, Cocoa, Chocolate, Sugar, by C. L. T. Beeching, F.G.I.

15 F. Demonstration to Commissioned Officers at the Islington Cattle Market, at 11 a.m.

15 F. Lecture to Commissioned Officers at 3.30 p.m. Canteen Supplies, Rice, Arrow-root, Flour, Biscuits, by C. L. T. Beeching, F.G.I.

15 F. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Care of Mother and Infant (2), by Margaret G. Thackrah, B.A., M.D., M.R.C.P.

15 F. Lecture to Sanitary Officers and Commissioned Officers, at 6 p.m. The Names and Situations of the Organs of the Body in Animals, by J. R. Hayhurst, M.R.C.V.S., D.V.S.M.

15 F.
16 S. } Examination—Sheffield.

16 S. Inspection and Demonstration at East Surrey Waterworks, Purley, at 2.30 p.m. Conducted by H. C. Adams, M.INST.C.E.

16 S. Demonstration to Health Visitors and Child Welfare Workers, in the Parkes Museum, at 3 p.m. Conducted by J. H. Clarke.

16 S. Demonstration—Meat Inspectors, at the Metropolitan Cattle Market, at 1.30 p.m.

18 M. Lecture to Sanitary Officers and Commissioned Officers, at 6 p.m. Practical Methods of Stalling and Slaughtering Animals, by J. R. Hayhurst, M.R.C.V.S., D.V.S.M.

18 M. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Infant Feeding, by G. Eric Pritchard, M.A., M.D., M.R.C.P.

18 M. Lecture to Commissioned Officers, at 3.30 p.m. Vegetables and Fruits, Jams, Condiments, etc., Prepared, Concentrated and Preserved Foods, by Colonel C. H. Melville, C.M.G., R.A.M.C.

19 Tu. Demonstration to Commissioned Officers at Smithfield Market, at 11 a.m.

19 Tu. Lecture to Commissioned Officers, at 3.30 p.m. Meat Inspection, by J. R. Hayhurst, M.R.C.V.S.

20 W. **Visit to Building Trades' Exhibition.**

20 W. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Infant Feeding, by G. Eric Pritchard, M.A., M.D., M.R.C.P.

20 W. Inspection and Demonstration at the Mitcham Margarine Works, at 2.30 p.m.

20 W. Lecture to Sanitary Officers and Commissioned Officers, at 6 p.m. Diseased Meat, with a Demonstration of Morbid Specimens collected from Meat Markets, by J. R. Hayhurst, M.R.C.V.S., D.V.S.M.

21 Th. Demonstration to Commissioned Officers at Smithfield Market, at 11 a.m.

21 Th. Lecture to Commissioned Officers, at 3.30 p.m. Meat Inspection, by J. R. Hayhurst, M.R.C.V.S.

22 F. Demonstration to Commissioned Officers, at Islington Cattle Market, at 11 a.m.

22 F. Lecture to Sanitary Officers and Commissioned Officers, at 6 p.m. The Hygiene of Cowsheds, Dairies and Slaughterhouses, by R. King Brown, M.D., D.P.H., M.O.H., Bermondsey.

22 F. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Food and Clothing, by A. Beresford Kingsford, M.D., D.P.H.

22 F.
23 S. } Examination—Belfast.

23 S. Demonstration—Meat Inspectors, at the Metropolitan Cattle Market, at 1.30 p.m.

25 M. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Care of Infants and Young Children, by Miss Isabel Macdonald.

25 M. Lecture to Sanitary Officers and Commissioned Officers, at 6 p.m. Meat Inspection in Retail Shops and Markets, by T. Dunlop Young, O.B.E., M.R.C.V.S., D.V.S.M., Veterinary and Chief Meat Inspector, Central Markets, Smithfield.

25 M. Lecture to Commissioned Officers, at 3.30 p.m. Alcoholic Beverages, Beer, Whiskey, Brandy, etc., by Colonel C. H. Melville, C.M.G., R.A.M.C.

26 Tu. Demonstration to Commissioned Officers, at Smithfield Market, at 11 a.m.

26 Tu. Lecture to Commissioned Officers, at 3.30 p.m. Meat Inspection, by J. R. Hayhurst, M.R.C.V.S.

27 W. **Ordinary General Meeting, at 4.30 p.m.**

27 W. **Lecture to Institute**, at 5.30 p.m., "Some Lessons of the War," by Colonel C. H. Melville, C.M.G., R.A.M.C.

27 W. Lecture to Commissioned Officers, at 3.30 p.m. Canteen Supplies, Jams, Preserved Fruits, Condiments, Lime Juice, etc., by C. L. T. Beeching, F.G.I.

27 W. Demonstration for Meat Inspectors at the Central Meat Market, Smithfield, E.C., at 11 a.m.

28 Th. Demonstration to Commissioned Officers, at Smithfield Market, at 11 a.m.

28 Th. Demonstration to Commissioned Officers, at 3.30 p.m. Canteen Supplies, Jams, Preserved Fruits, etc., by C. L. T. Beeching, F.G.I.

29 F. Demonstration to Commissioned Officers at the Islington Cattle Market, at 11 a.m.

29 F. Lecture to Commissioned Officers, at 3.30 p.m. Canteen Supplies, Canned and Cured Meats and Fish, Sausages, by C.L.T. Beeching, F.G.I.

29 F. Lecture to Meat Inspectors at 6 p.m., by J. R. Hayhurst, M.R.C.V.S., D.V.S.M.

29 F.
30 S. } Examination—London.

MAY.

2 M. Lecture to Commissioned Officers, at 3.30 p.m. Meat Inspection, by J. R. Hayhurst, M.R.C.V.S.

2 M. Lecture to Meat Inspectors and Commissioned Officers, at 5 p.m. Food Accessory Substances, Milk, Butter, Cheese, by W. J. Howarth, C.B.E., M.D., D.P.H.

3 Tu. Demonstration to Commissioned Officers at Smithfield Market, at 11 a.m.

3 Tu. Lecture to Commissioned Officers, at 3.30 p.m. Meat Inspection, by J. R. Hayhurst, M.R.C.V.S.

4 W. Visit to Factory for Commissioned Officers, conducted by C. L. T. Beeching, F.G.I.

4 W. Lecture to Commissioned Officers, at 5 p.m., Bread, Eggs, Tea, Coffee, Cocoa, and Other Foods, by W. J. Howarth, C.B.E., M.D., D.P.H.

5 Th. Demonstration to Commissioned Officers at Smithfield Market, at 11 a.m.

6 F. Demonstration to Commissioned Officers at the Islington Cattle Market, at 11 a.m.

6 F. Lecture to Meat Inspectors, at 6 p.m. by J. R. Hayhurst, M.R.C.V.S., D.V.S.M.

6 F.
7 S. } Examination—Manchester.

9 M. Visit to Factory for Commissioned Officers, conducted by C. L. T. Beeching, F.G.I.

9 M. Lecture to Commissioned Officers, at 5 p.m. Imported Meat, Cold Storage, Tinned and Potted Foods, Bacon and Hams, by W. J. Howarth, C.M.G., M.D., D.P.H.

10 Tu. Demonstration to Commissioned Officers at Smithfield Market, at 11 a.m.

11 W. Visit to Factory for Commissioned Officers, conducted by C. L. T. Beeching, F.G.I.

11 W. Demonstration in Fish Inspection for Meat Inspectors and Commissioned Officers, at the Institute, at 6 p.m., by Charles Hattersley, Chief Fish Inspector, Fishmongers' Company.

12 Th. Demonstration to Commissioned Officers at Smithfield Market, at 11 a.m.

12 Th. Visit to Factory for Commissioned Officers, conducted by C. L. T. Beeching, F.G.I.

13 F. Demonstration for Commissioned Officers, at Billingsgate Fish Market, at 11 a.m. Conducted by C. Hattersley, Chief Fish Inspector, Fishmongers' Company.

13 F. Lecture to Meat Inspectors at 6 p.m., by J. R. Hayhurst, M.R.C.V.S., D.V.S.M.

14 S. Demonstration—Meat Inspectors, at the Metropolitan Cattle Market, at 1.30 p.m.

17 Tu. Demonstration to Commissioned Officers at Billingsgate Fish Market, at 11 a.m.

18 W. Demonstration to Commissioned Officers at the Army and Navy Stores, Francis Street, Westminster, on Fruit and Vegetables, conducted by Mr. Brown, Manager of the Fruit and Vegetable Department.

20 F.
21 S. } Meat Examination—London.

27 F.
28 S. } Examination—Leeds.

JUNE.

3 F.
4 S. } Examination—Liverpool.

10 F.
11 S. } Examinations—Cardiff.

20-25. **Congress and Exhibition—Folkestone.**

LIST OF MEMBERS AND ASSOCIATES

ELECTED JANUARY, 1921.

* Marked thus have passed the Examination of the Institute in Sanitary Science as applied to Buildings and Public Works.
w Marked thus have passed the Examination of the Institute for Maternity and Child Welfare Workers.
§ Marked thus have passed the Institute's Examination for Sanitary Surveyors or Sanitary Inspectors (India).
v Marked thus have passed the Examination of the Institute for Women Health Visitors and School Nurses.
m Marked thus have passed the Examination of the Institute for Inspectors of Meat and other Foods.
§ Marked thus have passed the Institute's Examination for Sanitary Surveyors or Sanitary Inspectors (India).
s Marked thus have passed the Examination of the Institute in School Hypiene, including Elementary Physiology.

MEMBERS.

4654	1921. Jan.	*wv*ADAIR, Miss Florence Norah, *42, Moncrieff Street, Peckham, S.E.15.*
4643	1921. Jan.	AMRITARAJ, S., L.R.C.P.& S.(EDIN.), D.P.H. (CAMB.), *11, Spencer Road, Bangalore, South India.*
4655	1921. Jan.	*BELL, John George, *18, Nightingale Lane, Clapham Common, S.W. 12.*
4644	1921. Jan.	BENNETT, Lindley Henry, A.A.A., *Inspector of Schools, Mannville, Alberta, Canada.*
4645	1921. Jan.	COLSON, Charles Henry, O.B.E., M.INST.C.E., *Deputy Civil Engineer in Chief, The Admiralty, Whitehall, S.W. 1.*
4656	1921. Jan.	*wv*COOK, Miss Ellen Elizabeth, *42, St. Ann's Road, Barking, Essex.*
4660	1898. June	GARRETT, Henry Augustus, A.M.INST.C.E., *Borough Engineer and Surveyor, Town Hall, Torquay.*
4657	1921. Jan.	*GRIMMOND, Alexander Gow, *16, Terrace Road, Bournemouth.*
4646	1921. Jan.	HAWORTH, James Douglas, M.S.E., F.G.S., *Alliance House, 15, Dartmouth Street, Westminster, S.W. 1.*
4661	1911. May	‡LAYLAND, Robert Jasper William, M.INST.M.& C.E., *R.D.C. Offices, Billericay, Essex.*
4647	1921. Jan.	LOVEGROVE, Frederic Thomas, M.B., CH.B., M.R.C.S., L.R.C.P., *Tambellup, Western Australia.*
4648	1921. Jan.	LOW, John Spencer, C.B.E., B.SC., M.B., CH.B., D.P.H., *98, York Mansions, Battersea Park, S.W. 11.*
4649	1921. Jan.	MATSON, Lt.-Col. John (*Indian Army*), *Dromore Lodge, Kasauli, India.*

4650 1921. Jan. ‡*m* MERWOOD, William, *8, Priory Road, Carisbrooke, Isle of Wight.*

4658 1921. Jan. *PUZEY, Frederic Henry, *69, Limerston Street, Chelsea, S.W. 10.*

4659 1921. Jan. *RANDERSON, Henry Young, *"Cherrot," Amhurst Street, North Sydney, New South Wales.*

4651 1921. Jan. ‡*m*SPICKET, Thomas Lewis, *27, Somerset Road, Barry, Glam.*

4652 1921. Jan. ‡WEATHERITT, James, *Southwark Town Hall, Walworth Road, S.E. 17.*

4653 1921. Jan. WILKINS, Arthur Godfrey, M.B., CH.B., *Medical Inspector, County Education Offices, Stafford.*

ASSOCIATES.

8444 1921. Jan ‡BANKS, George, *5, Weston Street, Swansea.*

8445 1921. Jan. ‡BENJAFIELD, Herbert John, *Military Isolation Hospital, Aldershot.*

8446 1921. Jan. ‡BRADING, Ernest Frederick, *Broadhurst, Grove Road, Ventnor, Isle of Wight.*

8447 1921. Jan. *v*BROOKE, Miss Helen Christine, *72, Coleraine Road, Blackheath, S.E. 3.*

8448 1921. Jan. ‡BUDGE, Henry George, *Kingswood, New South Wales.*

8449 1921. Jan. ‡BURDEN, Alec, *62, Klein Street, Hospital Hill, Johannesburg, South Africa.*

8450 1921. Jan. ‡CARDEN, John Joseph, *37, Saint Peter Street, Rochester.*

8451 1921. Jan. ‡CLARE, Harry William, *Sanitary Inspector, Germiston, Transvaal, South Africa.*

8452 1921. Jan. ‡CLOSS-PARRY, John, *"Bull Hotel," Ebenezer, Cwm-y-Glo, Carnarvon.*

8453 1921. Jan. *v*CORDON, Mrs. Ida Florence Emma, *Woodside, London Road, Sutton, Surrey.*

8454 1921. Jan. *v*CORDWELL, Miss Alice May, *25, Francis Street, Tottenham Court Road, W.C. 1.*

8455 1921. Jan. ‡DAVIES, David Howel, *"Glen Aber," Cynwyd, Corwen, North Wales.*

8456 1921. Jan. ‡DRAKE, Reginald Arthur Hicks, *"Ravensbury," Hamstel Road, Southend-on-Sea.*

8457 1921. Jan. ‡FOOT, Miss Edith Robina, *12a, Argyle Street, King's Cross, W.C. 1.*

8458 1921. Jan. ‡FOX, Sydney, *26, Close Street, Hemsworth, York.*

8459 1921. Jan. ‡FREER, Miss Evelyn Elizabeth, *36, Fellows Road, South Hampstead, N.W. 3.*

8460 1921. Jan. ‡GEEN, Eric Lionel Welton, *3, Foxhall Road, Ipswich.*

8161 1921. Jan. *v*GOODMAN, Miss Dorothy, *The Borough Hospital, Croydon.*

8162 1921. Jan. ‡GROOME, George, *Wake's Colne, Earl's Colne, Essex.*

8180 1921. Jan. ‡GREEN, Frederick John Albert, *Sanitary Engineer and Inspector, Sanitary Dept., Town Hall, Westhoughton.*

8163 1921. Jan. ‡HILSLEY, John, *275, Eaves Lane, Chorley, Lancs.*

8164 1921. Jan. ‡HUTCHINGS, William Henry, *87, Estcourt Road, Fulham, S.W. 6.*

8165 1921. Jan. *v*LUCKETT, Miss Mabel, *Booth Hall Infirmary, Blackley, Manchester.*

8166 1921. Jan. *v*LUSTY, Miss Louisa Mary, *Stanley House, River, Dover.*

8167 1921. Jan. ‡MACDONALD, Hugh, *c/o Smith, 22, Gardner Street, Partick, Glasgow.*

8168 1921. Jan. ‡MACKRIELL, Thomas George, *19, Chapel Road, Redhill, Surrey.*

8169 1921. Jan. ‡MCPHERSON, Arthur George, *6, Fair Mile, Henley-on-Thames.*

8170 1921. Jan. ‡MEADOWS, Chevalier Philip Hamilton, *36, West End Road, Southall.*

8171 1921. Jan. *v*MURPHY, Miss Helen Annie, *34, Kempsford Gardens, Earl's Court, S.W.*

8172 1921. Jan. ‡O'DONOGHUE, Patrick Edward, *3, Montague Place, Brighton.*

8173 1921. Jan. *v*OLEY, Mrs. Ada Jane, *61, Campbell Street, Farnworth, nr. Bolton.*

8174 1921. Jan. ‡POWELL, Miss Agnes Edith, *28, Hampstead Road, Dulwich Hill, near Sydney, New South Wales.*

8175 1921. Jan. ‡ROBERTS, Alfred Reginald, *3, Marine Drive, Hornsea, Yorks.*

8176 1921. Jan. ‡SAUNDERS, Alan Blake, *56, Weston Road, Strood, Rochester.*

8177 1921. Jan. *v*TAMPLIN, Miss Ellen Mary, *"Ye Olde Cot," Staines Road, East Bedfont, Middlesex.*

8178 1921. Jan. ‡WALSH, Frank Barrington, *98, Winston Road, Stoke Newington, N. 16.*

8179 1921. Jan. ‡WEBB, George Herbert, *Surveyor and Inspector of Nuisances, Town Hall, Alton, Hants.*

8443 1921. Jan. WHITE, James Henry, *"Buckler's Court," St. Andrew's, Scotland.*

FEBRUARY, 1921.

MEMBERS.

4662 1921. Feb. BUCHIA, Shapurji Nasarwanji, B.E.(BOMB.), *Architect and Civil Engineer, Shakespeare Hut, Keppel Street, W.C. 1.*

4663 1921. Feb. ‡GEAKE, Herbert, M.S.A., P.A.S.I., *116, Raleigh Street, Nottingham.*

4664 1921. Feb. ‡HARPER, Robert Urwin, *Surveyor and Architect, South Shields R.D.C., Council Offices, East Boldon, Co. Durham.*

4665 1921. Feb. HATTON, Major Albert Edward, R.A.F., *Department of Works and Buildings, Air Ministry, R.A.F. Aerodrome, Donibristle, Inverkeithing, Co. Fife, Scotland.*

4666 1921. Feb. HIPWOOD, John William, A.M.INST.C.E., M.INST. M. & C.E., *Borough Surveyor and Waterworks Engineer, Town Hall, Newark, Notts.*

4667 1921. Feb. JERMAN, Arthur Edward, M.B., M.R.C.S., L.R.C.P., D.P.H. (*M.O.H.*), *Holme Leigh, Picardy Road, Belvedere, Kent.*

4668 1921. Feb. ‡*m*KEELEY, Robert, *42, Albert Avenue, Sedgley Park, Prestwick, Manchester.*

4674 1921. Feb. *KHANNA, Prem Nath, *3, Torrington Square, W.C. 1.*

4675 1921. Feb. ‡*m**LENNARD, Frederick Henry, *7, Chislehurst Road, Richmond.*

4679 1902. Nov. *LISTER, Reginald William, A.M.INST.C.E., *28, Burnage Hall Road, Levershulme, Manchester.*

4669 1921. Feb. ‡LITTLETON, Frank, *P.O. Box 236, Salisbury, Rhodesia.*

4670 1921. Feb. LLOYD, Harry Leopold, A.M.INST.M.&C.E., *Engineering Assistant, City Surveyor's Department, Town Hall, Wakefield.*

4676 1921. Feb. *vw*PEACEY, Miss Edith Constance, *26, Victoria Grove, Kensington, W. 8.*

4671 1921. Feb. POLE, Laurence William, M.B., CH.B., D.P.H. (*M.O.H.*), *Health Department, Town Hall, Llanelly, Carmarthen.*

4672 1921. Feb. SEYMOUR, Maurice Macdonald, M.D., D.P.H., *Commissioner of Public Health for the Province of Saskatchewan, Regina, Saskatchewan, Canada.*

4677 1921. Feb. *vw*TAFE, Miss Cicely Ursula, *24, Rutland Park Mansions, Walm Lane, Willesden Green, N.W. 2.*

4680 1899. June WALKER, George Charles, M.D., CH.B., D.P.H., D.T.M. (Capt., R.A.M.C.(T.F.)), *Public Health Department, Ford Street, Derby.*

4673 1921. Feb. WALTER, Ernest Henry Poole, *Borough Engineer's Office, Town Hall, Durban, South Africa.*

4678 1921. Feb. *vw*WILSON, Miss Martha Hannah Dawson, *St. Faith's Maternity Hospital, 63, Clarendon Road, Leeds.*

ASSOCIATES.

8182 1921. Feb. ‡BOWDEN, Arthur James, *51, North Road, Porth, Glamorgan.*

8181 1921. Feb. COLES, Albert Ronald, *128, Whitestile Road, Brentford, Middlesex.*

8183 1921. Feb. *v*DORRICOTT, Miss Mary, *7, Pretoria Terrace, CastleFields, Shrewsbury.*

8500 1918. June DOUGLAS, Donald, *2408, Heather Street, Vancouver, British Columbia.*

8498 1921. Feb. ‡DUNCAN, Albert Edward, *7, Cronkeyshaw Road, Rochdale.*

8184 1921. Feb. ‡FFOULKES, William Rowland, *Surveyor and Inspector, Rhianfa, Corwen, Merionethshire.*

8185 1921. Feb. ‡*m*GLOVER, James Arthur, *52, Moy Road, Roath Park, Cardiff.*

8186 1921. Feb. ‡HARDY, Norman, *Sanitary Inspector, Heidelberg, Transvaal, South Africa.*

8187 1921. Feb. ‡HEAD, Edward John, *"The Mount," Pontymoel, Pontypool, Mon.*

8188 1921. Feb. ‡MARTLEW, Frederick, *The Health Department, Wigan, Lancs.*

8501 1901. Nov. ‡*m*MOORHOUSE, Ernest Frederick, *Haigh Crest, Rothwell, Haigh, near Leeds.*

8189 1921. Feb. *v*PEPPER, Miss Florence, *Health Visitor, Public Health Department, Ipswich, Suffolk.*

8190 1921. Feb. ‡PLATT, Cecil, *Sanitary Inspector, Kirndeen Street, Culcairn, New South Wales.*

8499 1921. Feb. *v*ROTHWELL, Mrs. Edith Annie, *14, Cecil Street, Bilton, Harrogate, Yorks.*

8191 1921. Feb. *v*ROWLANDS, Miss Edith, *Woodbine Cottage, Newtown, Montgomeryshire.*

8192 1921. Feb. ‡SALMON, Miss Emma, *85, Thorpe Road, Staines.*

8193 1921. Feb. ‡STEEDEN, Edward James, *86, Oakdale Road, Leytonstone, E. 11.*

8194 1921. Feb. ‡SUMMERFIELD, Harold, *56, Grove Road, Folkestone, Kent.*

8502 1915. Mar. ‡*m*TAYLOR, James, *4, South Street, Wakefield.*

8195 1921. Feb. ‡TENCH, Sydney Alfred, *23, Perry Street, Northampton.*

8196 1921. Feb. ‡THOMPSON, Albert, *Market House, Harrogate, Yorks.*

8197 1921. Feb. ‡WRIGHT, William Henry, *2, Holly Villas, Ernest Road, Yiewsley, Middlesex.*

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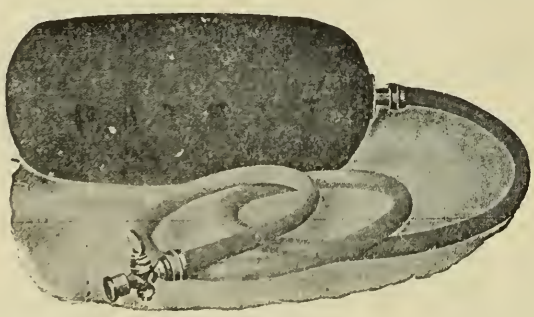
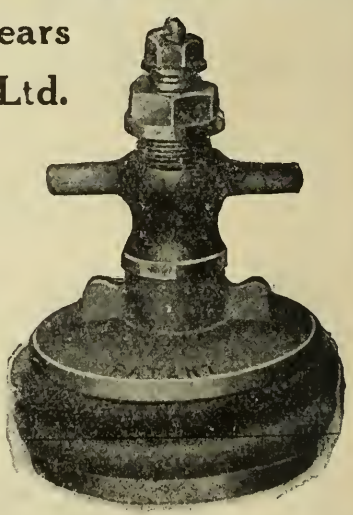


Patent Screw Expanding Stopper.



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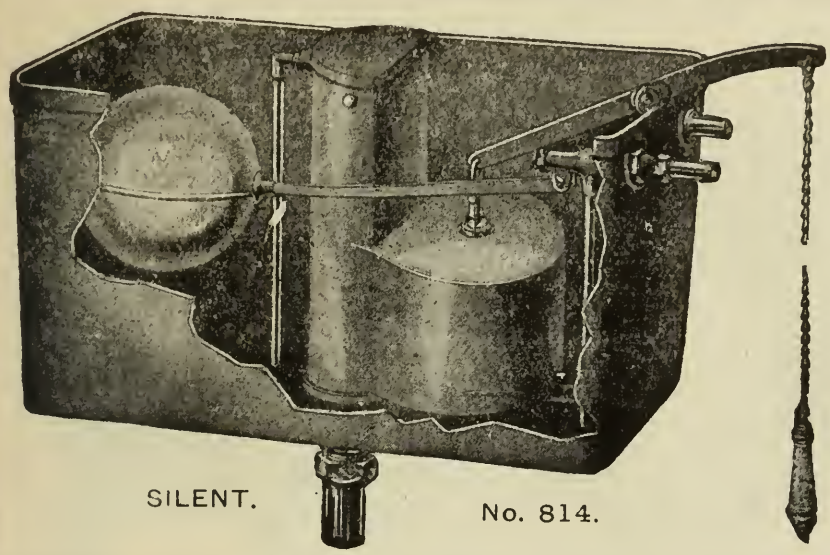

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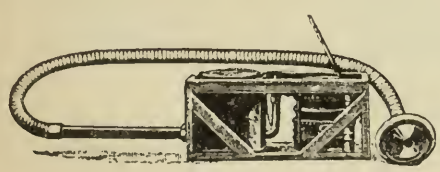

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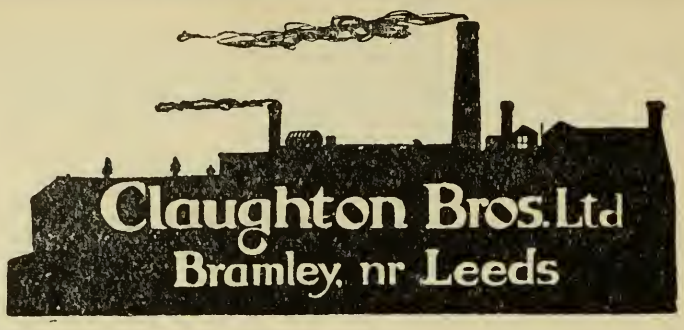

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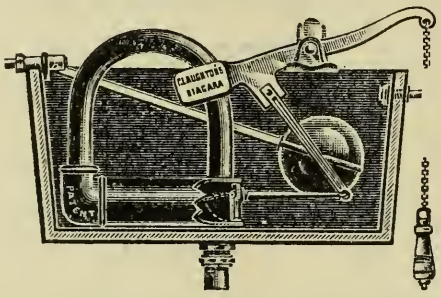

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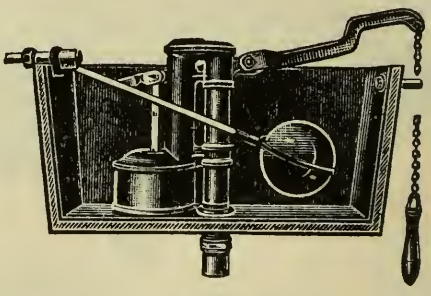

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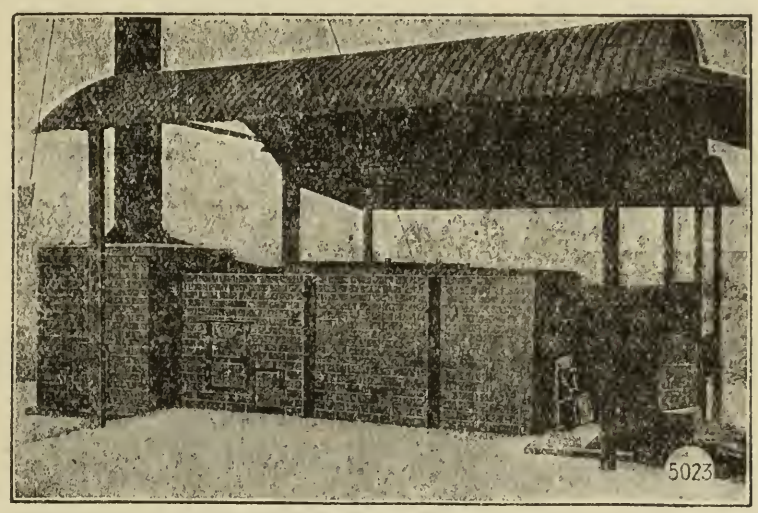

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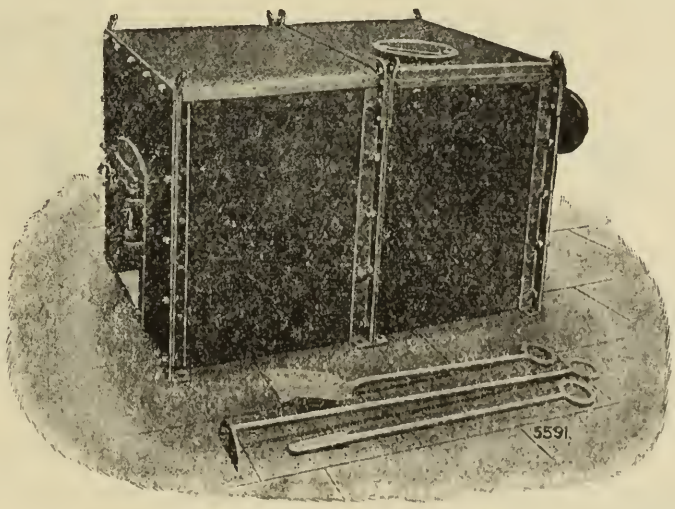

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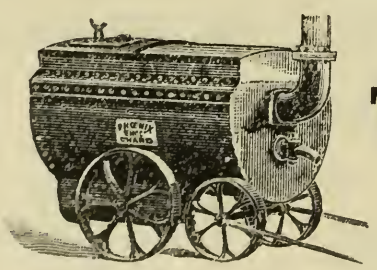

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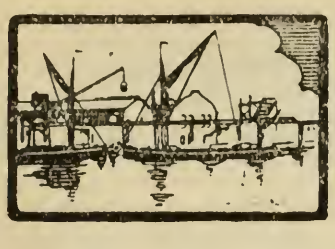

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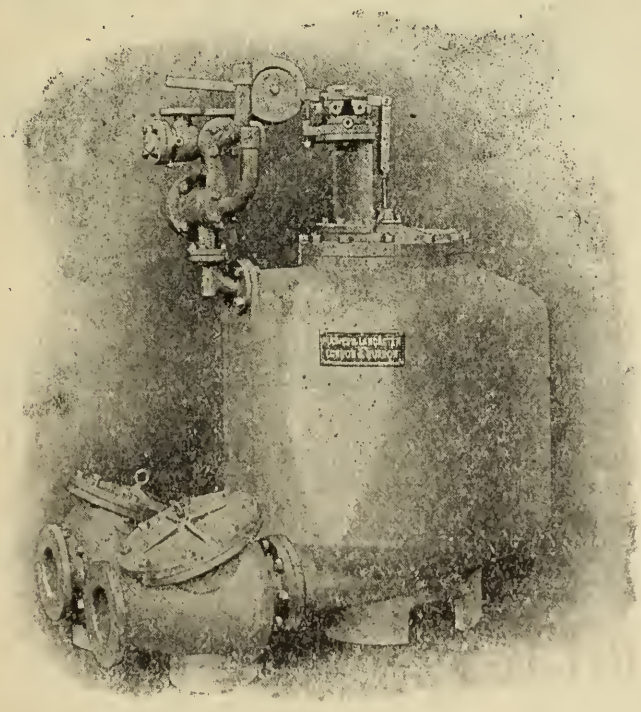

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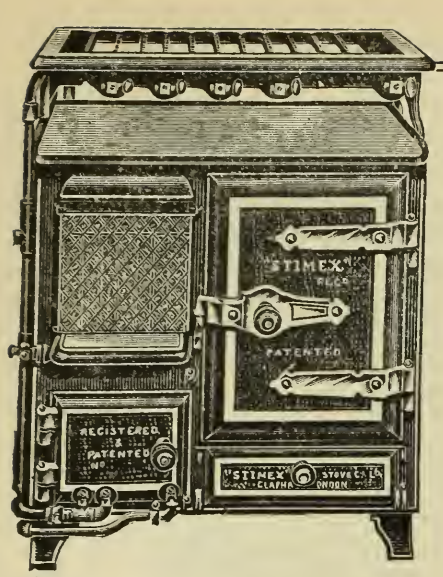

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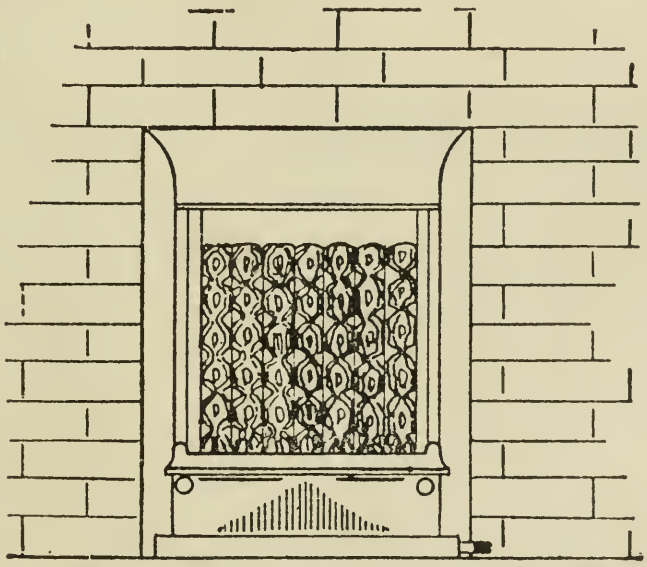

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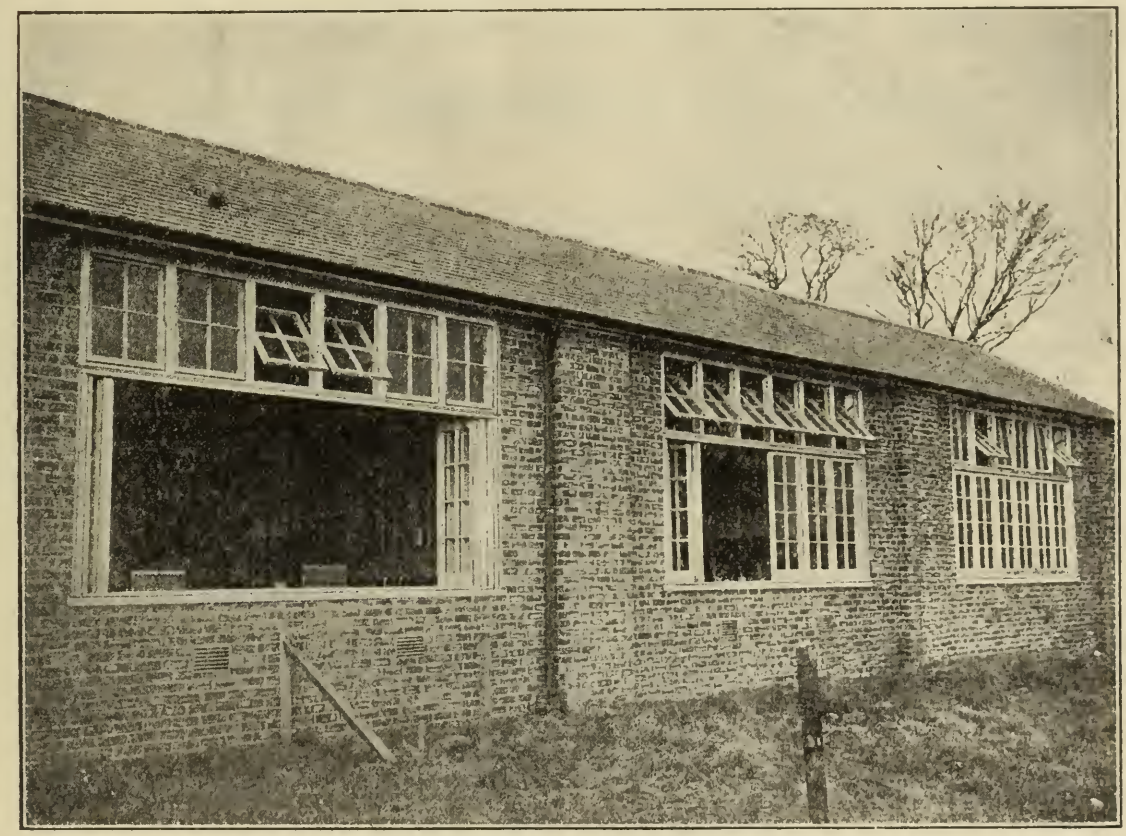

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THE ROYAL SANITARY INSTITUTE,

90 BUCKINGHAM PALACE ROAD, S.W. 1.

Patron—HIS MAJESTY THE KING.

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Telegraph: SANITUTE, CHURTON, LONDON.

NOTICES.

SESSIONAL MEETING.

London.—March 8th, at 5 p.m. Discussion on "The Sanitary Engineering Side of Town Planning," to be opened by Edward Willis, Assoc.M.Inst.C.E., F.S.I., Engineer and Surveyor, Chiswick, and on "Town Planning of Built-on Areas," by George Pepler, F.S.I., Town Planning Inspector, Ministry of Health. The Chair will be taken by Prof. H. R. Kenwood, C.M.G., M.B., F.R.S.E., Chairman of Council.

ORDINARY GENERAL MEETING.

The Ordinary General Meeting will be held at the Institute on Wednesday, April 27th, at 4.30 p.m.

LECTURE TO THE INSTITUTE.

Wednesday, April 27th, at 5.30 p.m. By Colonel C. H. Melville, C.M.G., M.B., D.P.H., R.A.M.C., on "Some Lessons of the War."

CONGRESS AND EXHIBITION, 1921.

Folkestone, June 20th to 25th. President, The Right Hon. The Earl of Radnor.

The Council invite papers on subjects relating to Health and Sanitary Science. Papers are limited to 3,000 words, and a short abstract must accompany every paper. Authors should forward their manuscripts by post as early as possible, and in any case not later than May 16th.

Members proposing to attend should make early application for their Congress tickets.

HEALTH WEEK

His Majesty the King, and Her Majesty the Queen, have graciously accorded their patronage to Health Week, which is to be held in October, 1921. The Right Hon. The Lord Mayor of London, Alderman J. Roll, has consented to act as Chairman of the General Committee.

Members of the Institute are invited to co-operate in promoting the success of the movement. Those prepared actively to assist are asked to send in their names to the Secretary.

[P.T.O

EXAMINATIONS.

In Sanitary Science as applied to Buildings and Public Works, for Inspectors of Nuisances, Maternity and Child Welfare Workers, Women Health Visitors and School Nurses, and School Hygiene, including Elementary Physiology, will be held at :—

Bristol, March 4th and 5th.	Belfast, April 22nd and 23rd.
Portsmouth, March 11th and 12th.	London, April 29th and 30th.
Edinburgh, March 18th and 19th.	Manchester, May 6th and 7th.
Aberystwyth, April 8th and 9th.	Alberta, Canada, April, 1921.
Sheffield, April 15th and 16th.	Hong Kong, June, 1921.

For Inspectors of Meat and other Foods :—
London, May 20th and 21st.

BUILDING TRADES EXHIBITION, OLYMPIA.

A visit has been arranged to this Exhibition on Wednesday, April 20th, at the invitation of Mr. H. Greville Montgomery. Those wishing to attend should send in their names to the Secretary of the Institute by April 13th, when tickets to admit them to the Exhibition will be forwarded.

NOTES.

Cloth Covers are prepared for Binding the JOURNAL and the Supplement, price 2s. 0d.

Forms for the proposal of New Members and Associates can be obtained at the Office ; any change of address should be at once notified.

(A detailed list of Lectures and Meetings is given in the Calendar in the Supplement, and syllabus can be obtained at the office.)

E. WHITE WALLIS,
Secretary.

March, 1921.

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